DOCUMENT RESUME

ED 160 754 08 CE 016 879

AUTHOR Hoyman, Ronald D.
TITLE The Development of a Series of Recommendations and Procedures Required in Administration of a Centralized Program of Occupational Competency Assessment.
INSTITUTION Pennsylvania State Univ., University Park. Div. of Occupational and Vocational Studies.
SPONS AGENCY Bureau of Occupational and Adult Education (DHEW/OE), Washington, D.C.
PUB DATE May 78
NOTE 164p.; Master's Thesis, Pennsylvania State University ; Parts of appendix marginally legible due to print quality; Best copy available

EDRS PRICE MF-$0.83 HC-$8.69 Plus Postage.
DESCRIPTORS *Evaluation Methods; Masters Theses; Occupational Tests; Performance Criteria; *Program Administration; State Programs; *Teacher Evaluation; *Teacher Qualifications; Teaching Skills; Testing; *Vocational Education Teachers
IDENTIFIERS Pennsylvania

ABSTRACT

A study was conducted to provide information and representative examples necessary for the establishment of administrative procedures required in conducting a statewide program to assess the occupational competency of vocational-technical instructors. The data used in the study was obtained from a review of the current literature, samples of forms and procedures used in Pennsylvania's occupational competency assessment program, and interviews. From these a series of eight proposed recommendations and procedures for the administration of a centralized program were made. These are discussed under the following topic headings: (1) funding and proposal guidelines for a program of occupational competency assessment, (2) development of a centralized office for occupational competency assessment, (3) procedures for evaluation of the candidate in occupational competency assessment, (4) coordination and use of National Occupational Competency Testing Institute Examinations, (5) procedures for development of written occupational competency examinations, (6) procedures for development of performance occupational competency examinations, (7) procedures for test development and test examiner workshops, and (8) procedures for maintenance and improvement of occupational competency assessment. (Over one-half of the document is appended material related to the procedures discussed.) (JH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED160754

The Pennsylvania State University

The Graduate School

Division of Occupational and Vocational Studies

The Development of a Series of Recommendations and Procedures Required in Administration of a Centralized Program of Occupational Competency Assessment

A Master's Term Paper in

Vocational Industrial Education

by

Ronald D. Hoyman

BEST COPY AVAILABLE

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Masters of Education

May, 1978

Date of Approval:

5/11/78 — Jerry L. Wircenski
Associate Professor
Thesis Advisor

5/10/78 — Frederick G. Welch
Professor in Charge of
Vocational Industrial Education

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CE 016 879

ACKNOWLEDGMENTS

The writer would also like to personally acknowledge and thank Mr. Gerald W. Funk, Pennsylvania Coordinator of Occupational Competency Assessment; Mr. Harry M. Kraft, Assistant Professor and Coordinator of Occupational Competency Assessment for The Pennsylvania State University; and Dr. Jerry L. Wircenski, Associate Professor and graduate advisor at The Pennsylvania State University. The splendid support and valuable information supplied by these men helped make the many ideas and recommendations mentioned in this proposal possible.

Special recognition should also be given to my wife, Marilyn, for the time, encouragement and support she has given me in working towards vocational and career goals which have culminated in the development of this paper.

TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS ii

Chapter

I. INTRODUCTION 1

Need for the Study 1
Statement of the Problem 2
Objectives 4
Definitions and Terms Used in Occupational Competency Assessment. 5

II. REVIEW OF THE LITERATURE 11

Introduction 11
Historical Development of Occupational Competency Assessment. 11
Relationship Between Written and Performance Tests 13
Alternative Methods of Occupational Competency Assessment. 16
Credential Review. 18

III. PROCEDURES 21

Introduction 21
Research of the Literature 21
Interviews 21
Data Gathering 22
Data Analysis. 22

IV. FINDINGS 24

Introduction 24
Procedure 1 Funding and Proposal Guidelines for a Program of Occupational Competency Assessment 26
Procedure 2 Development of a Centralized Office for Occupational Competency Assessment. 30
Procedure 3 Procedures for Evaluation of the Candidate in Occupational Competency Assessment 36
Procedure 4 Coordination and Use of National Occupational Competency Testing Institute Examinations 40
Procedure 5 Procedures for Development of Written Occupational Competency Examinations. 43
Procedure 6 Procedures for Development of Performance Occupational Competency Examinations. 51
Procedure 7 Procedures for Test Development and Test Examiners Workshop. 57
Procedure 8 Procedures for Maintenance and Improvement of Occupational Competency Assessment. 62

TABLE OF CONTENTS (Continued)

Page

Chapter

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS. 65

Need for the Study 65
Statement of the Problem 65
Purpose of the Study 66
Review of the Literature 66
Objectives 67
Conclusions. 67
Recommendations. 68

REFERENCES. 71

APPENDIX A: 73

Example 1 Occupational Competency Certificate. 74
Example 2 Occupational Competency Assessment Fee Schedule. . 75
Example 3 Resume of Program Cost for Candidate Assessment. . 76
Example 4 Funding Proposal Abstract. 78
Example 5 Funding Proposal Outline 81

APPENDIX B: 83

Example 1 Policy Manual for Administration of The Occupational Competency Assessment Program 84
Example 2 Approved Vocational Course and Certification Titles 87

APPENDIX C: 88

Example 1 Occupational Competency Evaluation Program 89
Example 2 Check List for Candidates Experience 91
Example 3 Pre-Assessment Test Examples 92
Example 4 Scope of the Exam Description. 93
Example 5 Scope of the Exam Written and Performance Test Percentage Breakdown 94
Example 6 Application for Occupational Competency Examination. 95
Example 7 Verification of Work Experience Form for Occupational Competency Evaluation 97

APPENDIX D: 99

Example 1 NOCTI--Examination Order Form. 100
Example 2 NOCTI--Order Form for NOCTI Materials. 101
Example 3 NOCTI--Scope of the Exam Sample. 102
Example 4 NOCTI--Directions for Completing Registration Form 103
Example 5 NOCTI--Registration Form 104

TABLE OF CONTENTS (Continued)

Page

APPENDIX E: 105

Example 1 Validation Study Occupational Area Selection Form 106
Example 2 Validation Study Request Authorization Letter. . . 107
Example 3 Cover Sheet for Occupational Competency Examinations 108
Example 4 Cover Page for Written Test. 109
Example 5 Written Test--Instructions to Candidate. 110
Example 6 Written Examination--Directions for Answering Questions. 111
Example 7 Occupational Scan Sheet--General Answer Sheet. . . 112
Example 8 Written Examinations--Diagnostic Overlays. 114

APPENDIX F: 116

Example 1 Performance and Written Examination Proportioning Work Sheet. 117
Example 2 Cover Sheet--Performance Test Examiners Copy. . . 118
Example 3 Performance Examination--Examiners Report 119
Example 4 Performance Examination--Job Description Sheet. . 120
Example 5 Performance Examination--Examiners Instructions. 121
Example 6 Performance Examination--Materials, Tools, Equipment List. 123
Example 7 Performance Examination--Directions for Examiner Sheet. 124
Example 8 Performance Examination--Examiners Drawing. . . . 125
Example 9 Performance Examination--Evaluation Sheet 126
Example 10 Cover Sheet--Performance Test, Candidates Copy. 127
Example 11 Performance Test Instructions to Candidate. . . . 128
Example 12 Performance Examination--Safety Evaluation Sheet 129
Example 13 Performance Examination--General Instructions to Candidate. 130
Example 14 Performance Examination--Directions for Candidates Job. 132

APPENDIX G: 133

Example 1 Travel Expense Voucher 134
Example 2 Master List for Test Development or Test Examiner Workshops 135
Example 3 Cover Letter for Test Development or Test Examiner Notification. 137
Example 4 Verification Response for Test Development or Test Examiner Workshops. 139

TABLE OF CONTENTS (Continued)

Page

APPENDIX H: 140

Example 1 Master List of Occupational Competency Examinations 141
Example 2 Occupational Competency Evaluation Program Examination Maintenance Form 142
Example 3 Record of Materials Sent to Other Testing Centers. 143
Example 4 Checklist for Development of Occupational Competency Examinations. 144
Example 5 Frequency of Occupational Competency Examinations Administered Checklist 145
Example 6 Checklist for Cost Analysis of Candidates Assessed 146

Chapter I

INTRODUCTION

Need for the Study

As society grows more complex and many occupations more specialized, it becomes increasingly hazardous, if not impossible to depend on rules of thumb to judge the abilities of those who supply needed services, (Educational Testing Service).

Construction workers, dental assistants, and bank tellers are just a few examples of the many semi-skilled, skilled, and professional vocational-technical oriented workers who affect the health, safety, and financial welfare of everyone in our society at one time or another. Subsequently, the importance and competency of vocational-technical oriented workers becomes increasingly important. Whether it relates to preparation of youth, new workers, or upgrading of adults in their respective area of occupational training and competency.

With the continuing growth of the labor force and increasing demands for training through vocational-technical education programs, the need for occupationally competent tradespersons and technicians is critical. The level of occupational competence is the keystone upon which a sound program of instruction is built. Although it is essential that the prospective teacher possess the personal qualities that are fundamental to teaching, there must also be evidence that the range of occupational competence is adequate to meet the full spectrum of youths, adults, and those of industry. (Panitz, 1975)

Consequently, there has been a growing concern over the need to accurately evaluate the occupational competency of vocational-technical

instructors. This concern has been expressed by vocational school administrators, leaders in industry, industrial-vocational teacher educators, state representatives, and vocational teachers themselves. (Panitz, 1975) Experience has shown that the quality of occupational workers depends on the occupational competency of the vocational instructor. Thus, the need for reliable and valid instruments which evaluate practical skills and related technical knowledge from the standpoint of knowing how to do a job and being able to perform the job becomes critical. It is generally accepted that the quantity and quality of instruments needed to assess occupational competency is an issue which many states are beginning to take a closer and more positive attitude toward in assessing instructor competence. Standards are being sought to judge teaching/learning effectiveness in terms of skill and related technical competency.

Statement of the Problem

As the demand for occupational competency assessment of vocational-technical instructors grows on a statewide and national level, the central problem is not realizing the need for occupational competency assessment, but how to effectively develop, administer, and conduct such a program.

The problem of establishing a centralized program for administering an occupational competency assessment program was emphasized in a report given at the American Vocational Association Convention in Atlantic City, New Jersey on December 5, 1977. This report revealed that the vast majority of occupational competency examinations administered by the National Occupational Competency Testing Institute in 1977 were conducted by only four of the 45 states represented in the NOCTI consortium.

Notably, New York, California, Pennsylvania, and Florida have made extensive use of occupational competency examinations as a requirement for certification as a vocational instructor. (Panitz, 1971) Pennsylvania alone administered 138 (NOCTI) examinations from June 1, 1976 through June 30, 1977, out of a statewide total of 305 occupational competency examinations administered during that period. These statistics alone indicate the lack of administrative programs available at the state or local level versus the representative need shown in the NOCTI consortium.

The basic issues and problems which must be addressed in coordinating and administering an occupational competency assessment program are:

1. The establishment of a centralized headquarters for coordinating and administering occupational competency examinations on a national and statewide basis.
2. The development of a constructive series of procedures and examples that can be followed in establishing a center for administration of a program for occupational competency assessment.
3. The development of a program for constructing and upgrading written and performance tests that adequately measures the cognitive and psychomotor skills of instructional personnel in each occupational area required for competency assessment.

Determining the objectives necessary for conducting or continuing a full scale program of occupational assessment are not simple problems that can be resolved easily. However, the objectives and procedures set forth for administering an ongoing center of occupational competency assessment should help relate the importance and feasibility of conducting such a program.

Objectives

The purpose of this paper was to provide the basic information and representative examples necessary for the establishment of administrative procedures required in conducting a program of occupational competency assessment. The specific objective was the establishment of a centralized program for assessing the competency of vocational-technical instructional personnel on a statewide basis. This assessment could vary to some degree from one state to another, depending upon the type of vocational-technical training programs and institutions they conduct, and upon the individual states instructor requirements for work experience, educational credentials, on a combination of both. Although, it should be recognized that there is no variation or substitution for the development and operation of a valid and reliable occupational competency assessment program.

The National Occupational Competency Testing Institute is a valuable source of aid and reference for assessing the competence of vocational-technical instructors. However, the national scope of NOCTI cannot be achieved without cooperation and utilization of common goals for occupational competency assessment set forth by the 45 representative states in the NOCTI consortium.

The objectives set forth in establishing and administering a statewide center for occupational competency assessment are crucial not only to local requirements and standards of vocational-technical education but national interest as well. The specific objectives for the establishment of a statewide center for competency assessment are:

1. The development of considerations and steps needed for proposing and funding an occupational competency assessment program.
2. The development of standard operational and maintenance procedures required in establishing and conducting an occupational competency assessment program?
3. The establishment of methods to incorporate written and performance tests in a feasible and cohesive manner?
4. The development of methods to determine, identify, and train support staff in conducting a feasible program of occupational competency assessment.

The specific objectives stated above will be evaluated and developed through a series of eight recommendations and procedures used in the operation of a centralized program for occupational competency assessment.

Definitions and Terms Used in Occupational Competency Assessment

In order for the reader to have a basic understanding of the material presented, it is necessary to identify and define the terms and abbreviations used in this study.

O.C.E.--Occupational Competency Examination

Occupational Competency--an acceptable level of performance upon which evaluation depends; the conditions under which the work is carried out; the tasks that are performed at various levels; the information, judgments, facts, and how to apply them to work situations; and a wide range of complete skills applied to a multitude of work assignments. (Panitz, 1975)

NOCTI--the National Occupational Competency Testing Institute. This is an organization composed of a consortium of 45 states for the advancement and improvement of occupational competency in vocational-technical education on a national scale.

Candidate--any person who is applying or being assessed for occupational competency by an occupational competency examination in his/her vocational-technical trade area.

Program Administrator--the head of the occupational competency examination center who is responsible for supervisor of the states occupational competency assessment program, test development, and support staff.

Occupational Assessment Coordinator--this person acts as an assistant to the program administrator and is primarily responsible for: publicizing tests; counseling, admitting, and approving applicants for assessments; arranging for assessment facilities and examiners; and reporting assessment results.

Policy Manual--this is a state manual describing administration of the occupational competency assessment program for vocational instructional certification candidates and vocational intern candidates.

Master Test List--this is a list of all vocational and technical competency examinations administered by a state center with checklist categories of information on each test title.

Course description book--this is a booklet describing the United States Office of Education Code Number, (U.S.O.E.) or state center certificate title and number, and certification method (example: 17.0100 - Air Conditioning - 2001 - O.C.E. Test).

Occupational Competency Examination (O.C.E. brochure)--this is a brief brochure description of a candidates:

I. Authorization

II. Eligibility Requirements

III. Employment Experience Guidelines

IV. Application Forms, Fees

V. Credentials

VI. Examination/Evaluation

VII. Re-examination

Scope of Exam--this is a booklet describing the type of jobs or skills required by each approved instructional title and a percentage breakdown with a sentence description of the written and performance aspects of each title. Each percentage breakdown is based on 100 percent written and 100 percent performance.

Check List of Candidate's Experience--this is a breakdown of key elements in each occupation according to major divisions and the important subparts of each division.

Pre-Test--these are short tests of approximately 30 questions in length which are representative of each occupational competency examination. Each test is used for pre-assessment of a candidates occupational experience.

Applications--this is a descriptive application form requiring each candidate to list and verify educational and work experience applicable to the title of the occupational competency examination he/she is applying for. It must be notarized before submitting for final approval.

Registration Form for NOCTI Examinations--this is an application the candidate must complete in order to qualify for a NOCTI examination. Instructions for completion of this form and a ticket of admission for the NOCTI examination are also included on this form.

Testing Instruments--these are descriptive and detailed guidelines and explanations on each O.C.E. examination. They are broken down into Written Test (approximately 200 multiple choice questions), Performance Test (Examiners copy with detailed scoring breakdown) and Performance Test (Candidate's copy of performance instructions and drawings).

Written Examination--a 180-200 multiple choice test which assesses the cognitive areas and knowledge gained on the job in a specific occupational area.

Performance Examination Examiners Copy--a test designed for the examiner to analyze and measure a candidates skill and performance ability in occupational related recognition tests, simulated condition tests, work sample tests, or any combination of the three job related assessments.

Performance Examination Candidates Copy--a test which covers the same job skills and occupational test areas in a specific occupation as the examiners test copy. With only the minimal information supplied to the candidate for necessary completion of the jobs listed.

Order Form for NOCTI Materials--this is a form that any authorized state or local occupational competency testing center used to secure information or material used in administration of NOCTI examinations.

Order Form for NOCTI Examinations--this is a separate order form listing the 26 occupational competency examinations available from NOCTI. This form is used when requesting one or all of the NOCTI examinations for administrative purposes.

Occupational Scan Sheets--a general purpose answer sheet used for computer scoring of O.C.E. written examinations.

Diagnostic Overlays--this is a transparent overlay which outlines each optical scan sheet according to the major occupational divisions of each written examination.

Certificates--this is an official document which certifies that the candidate has demonstrated occupational competency according to trade title and U.S.O.E. code number.

Validation Studies--a method of testing and approving questions for occupational competency written examinations.

Master List of Examiners--a manual of names and addresses of personnel who have attended training and who have qualified as examiners for O.C.E. test examinations in their respective occupational area.

Frequency of Test Administration--this is a complete list of every occupational competency examination title with a frequency breakdown of the number of times each test was administered during the past year.

Cost Analysis Record--this is a record keeping form for determining the production and administrative cost of each O.C.E. administered by candidate name.

Cost Analysis Resume'--this is a breakdown of the number of occupational competency tests administered during the past year according to the program cost of testing on a successful cost rate and failure cost rate.

Inventory Control--this is a form developed for keeping a current record of all O.C.E. test materials sent to other testing institutions/ centers.

Chapter II

REVIEW OF THE LITERATURE

Introduction

In examining the literature available on administrative duties and plans required in conducting a program of occupational competency assessment, it was found that until recently little if any consideration has been given to this important issue. However, some important developments and information which relate to the administration of an occupational competency assessment program which need to be examined are: the historical development of occupational competency assessment; the relationship between the development of written and performance testing; the establishment of a National Occupational Competency Testing Institute; and the review of alternative methods used in establishing valid indicators of occupational competency assessment.

Historical Development of Occupational Competency Assessment

Throughout America's history, much effort has been directed toward the development of procedures and instruments for the evaluation of human characteristics and abilities. Frequently, for the purpose of predicting future achievement, tests have been developed to measure general achievement. (Panitz, 1971) For this reason literature and examples of tests on general achievement are rather extensive.

However, the development of procedures and instruments which evaluate practical skills and technical knowledge has been minimal and sporadic throughout the many years of test development. (Panitz, 1975) Only during periods of national emergency, depression, and recently the

need for accountability, has a resurgence of effort been made for development and refinement of practical performance tests. Such agencies as the Armed Forces, Civil Service, and the United States Employment Service were instrumental in using performance testing instruments towards classifying people according to certain skill levels.

Within the rapid expansion of the industrial revolution in America came an increasing need for workers who possess some form of marketable vocational or technical skill. In turn, this need brought about an expansion of vocational industrial-technical education, and a demand for competent tradespersons and skilled technologists to teach the many varied vocational and technical education programs. Subsequently, the crucial question arose concerning the availability of objective instruments to ascertain whether the prospective teacher possesses the broadly based occupational competence needed for quality instruction. (Panitz, 1975) This availability of occupational competency examinations requires a closer assessment of the development of performance testing.

The proper objective of an occupational competency test is to pinpoint the particular skills and knowledge needed for a given situation and devise, a method for evaluating those qualities. (Comer, 1971) Since World War I, test specialists have made great advances in measuring both aptitude and achievement by means of paper and pencil tests. (Boyd and Shimberg, 1971) By contrast, performance testing has been largely neglected. The high cost of administration, and individualized testing and scoring made performance tests less feasible and attractive in the eyes of many evaluation groups or institutions. To gain a total

prospective on developing a reliable and valid occupational competency system of testing an effort was made to determine factors and test items necessary to develop a reliable and valid occupational competency examination.

Relationship Between Written and Performance Tests

Occupational competency evaluators recognized that there is a fundamental difference between knowing about a job and being able to do the job. "Knowledge of" is really an essential ingredient for doing a complex job correctly, but while it is a necessary condition, it is rarely a sufficient condition for satisfactory performance. (Boyd, 1971) The realization and importance of job proficiency along with cognitive knowledge in vocational-technical skill assessment expressed the need for performance testing in occupational competency assessment. But how could performance testing of actual job skills be incorporated with written tests in a feasible and cohesive manner? One manner in which this can be accomplished is through an analysis of the factors and components which make up valid and reliable written proficiency tests, performance based proficiency tests, or a combination of both.

In establishing content validity, test developer's must focus on a representative sampling of the items to be measured in each specific occupational competency test. Thus, whether they work with "knowledge of terms" and "understanding of physical principles" together with or separate from the "ability to work within specific tolerances," the representativeness of the selected items should be the same. (Impellitteri, 1966)

Written proficiency tests are effective instruments in: appraising factual knowledge, technological information, understanding of machines and tools, characteristics of materials, necessary calculations, reading and interpretation of graphic representations, scientific principles, judgments and procedures involved in planning, classifications, and general knowledge and work habits of an occupation. These areas of occupational competency are easier to administer, quicker to score and provide more objective results in written test form. (Panitz, 1971)

On the other hand performance and proficiency tests involve a recognition test, a simulating condition test, or work sample test conditions. A good performance-proficiency test will involve measurement of critical skills, selected manipulative processes, actual operation of machines, tools and instruments used in a job, step-by-step procedures in performing a job, planning and replacement of defective parts, and adjusting, maintaining, and utilizing instruments of a specific occupation. (Panitz, 1971)

By now the importance of both written and performance based occupational competency assessment in developing a total occupational competency examination should be apparent. The diagnosis and development of these tests for every area of vocational and technical training is a very large and complicated task that is continually being advanced.

One of the first reports of occupational competency evaluation by means of performance tests dates back to 1933 at the University of Pittsburgh. (Panitz, 1975) In 1959, a survey by Dr. Carl Scheafer showed that 16 states were using tests to evaluate trade competency. However, discussions with officials responsible for vocational education and teacher certification in these states revealed that considerable dissatisfaction existed with the quality of these tests. (Panitz, 1971)

A national effort on development improvement, dissemination, and evaluation of materials and processes involved in occupational competency assessment would reduce or eliminate costly duplication now found among a number of states. Substantial economic savings should be achieved and the quality of the test greatly improved by a national effort. A national effort would also provide flexibility in the use of such tests in that all states would have access to each examination, and each state would retain wide latitude in the use and interpretation of the results. (Panitz, 1971)

According to Panitz (1971) the development of a consortium of states on national occupational competency testing could establish:

1. Minimum required levels of occupational competency on a national scale.
2. Reciprocal arrangement for acceptance of individual certification from one state to another.
3. Occupational competence levels among teachers on a national basis.
4. Greater acceptance of occupational competency in institutions of higher learning.
5. A more professional approach toward certification and gain greater professional recognition.

Consequently, when all factors were considered, a National Occupational Competency Testing Project was formed under a grant from the U.S. Office of Education. As a natural outgrowth of this project, the National Occupational Competency Testing Institute became an active and permanent organization. The NOCTI organization is governed by a National

Consortium of States (45 states have designated representatives) and administered by an Administrative Board whose members are elected by the consortium of states--one from each of ten regions. (Panitz, 1975)

Alternative Methods of Occupational Competency Assessment

Although the importance of a national or statewide program of occupational competency assessment cannot be overemphasized from the standpoint of valid and reliable written and performance examinations, it must also be recognized that there are other forms of assessing occupational competency in vocational-technical education. For this reason it is necessary to briefly reflect on the methods used in occupational competency assessment that will not be emphasized.

Occupational competency is being assessed to a lesser degree through the use of oral examinations, credential review and licensing, or degree program certification.

When there are circumstances and conditions when neither a written or performance test is applicable or available, a program of oral testing is often developed. Provisions are made to secure three to four competent personnel or craftspersons in the area to be tested to act as a panel of experts in formulating questions and evaluating the responses to these questions by the examinee. The drawbacks to this form of testing can mainly be strengthened by following a strong program of oral test item development. The oral questions administered must be skillfully formulated and worded, clear in meaning, phrased in the vocabulary of the occupation, at a level of difficulty experienced on the job, avoiding terms that are local or geographic, representing all levels of occupational difficulty, and aiming toward a balance of test items representative of each major component part of a trade. (Panitz, 1971) Moreover,

oral testing as a means of measuring occupational competency must be evaluated according to the following limitations or advantages. (Panitz, 1971)

Limitations of oral testing are:

1. Validity of assessing knowledge of an occupation or actual skill.
2. Difficulty of developing valid and reliable oral examination questions.
3. Difficulty of establishing a competent group of oral examiners.
4. Difficulty of giving objective ratings to oral examination answers.
5. The answers to oral test items are extremely difficult to treat statistically.
6. Possibility that a single key element of a process will give you an indication of knowledge or ignorance of the whole process.
7. Difficulty of keeping oral questions confidential between examinees.
8. Low failure rate indicates low validity of oral examinations.

Advantages of oral testing are:

1. Ease and quickness.
2. Relatively inexpensive to administer.
3. Immediate feedback of knowledge and results.
4. Some forms of oral examinations can be given when no other type of examination exists.

Credential Review

Credential review or licensing is basically a form of granting occupational competency in an occupation where a person has completed a specific training program (three years or less), a supervised program of work experience, or usually a combination of both. Credential review standards are generally established by professional associations or state licensing bodies. On the other hand, degree program certification involves the granting of occupational competency in a profession or occupation where a person has completed a structured learning program resulting in attainment of a four year baccalaureate degree. Although licensing, credential review or degree program certification are based on standards established by professionals in their respective fields of occupational training there still exists the question of how these standards relate to valid and reliable occupational competency assessment. Some questions as to the occupational competency standards for licensing, credential review or degree program certification are:

1. Has a determination been made regarding the manipulative skills of the candidate?
2. Is specific occupational competency being granted for a general training or educational background?
3. Has sufficient occupational competency been achieved through standards rather than proven job performance?
4. Is this form of occupational competency assessment subjective or bias?

5. Is the assessed learning or training period required sufficient and reliable for a standard system of competency approval?
6. Could candidate assessment be improved through development of written performance test? (Panitz, 1975)

The type of occupational competency evaluation assessment a candidate is required to take depends largely upon his/her field of training and level of educational and work experience acquired at the time of test application. However, it is generally agreed that the major divisions of vocational-technical training determines the appropriate test for each category. The major divisions and accepted test for each division are:

1. Agriculture--Degree Program/Credential Review
2. Business Occupations--Degree Program
3. Distributive Education--Degree Program
4. Health Occupations--Credential Review/Occupational Competency Examination or Licensure
5. Home Economics--Degree Program/Credential Review/Occupational Competency Examination
6. Trade and Industrial--Occupational Competency Examination, Oral Examination, or Licensure.

As indicated by the major division breakdown the area where written and performance competency examinations are more widely needed and used is that of trade and industrial. Written and performance examinations are extensively used in trade and industrial competency assessment because: in most cases instructors are obtained directly from industry, not a structured learning system or institution; the areas of

trade and industrial education are highly specialized and performance oriented; there are too many trade and technical areas represented to establish one standardized form of competency accreditation; and the representatives of trade and industrial education believe written and performance based examinations are the most valid and effective way of assessing occupational competency.

It is hoped that the other divisions of vocational-technical training that have stressed oral examination, licensure, credential review, or degree program certification might consider strengthening occupational competency assessment through increased use of written and performance based assessments. This would assure a more precise method of assessing a candidate's ability by both written and performance standards, and provide better statistical measures and accountability.

Chapter III

PROCEDURES

Introduction

The administration of an occupational competency program including counseling, diagnostic, development, dissemination, and evaluation of materials and processes involved in competency assessment is a very extensive program. For this reason, the administrative duties required in conducting a program of occupational competency assessment will be described through a series of objectives, recommended procedures and examples of documents used in occupational competency assessment centers.

Research of the Literature

The first step in developing a series of recommendations and procedures required in the administration of a centralized program of occupational competency assessment required an indepth review and research of the literature. The literature was reviewed according to the historical development of occupational competency assessment, the relationship between written and performance testing as it applied to occupational competency assessment, the development and significance of the National Occupational Competency Testing Institute and the use of and relationship between written and performance based competency assessment versus alternative methods.

Interviews

After an extensive review of the literature had been undertaken a series of interviews and work sessions were coordinated and conducted with representatives of the Pennsylvania occupational competency assessment

program. Notably, sessions with Mr. Gerald W. Funk, Pennsylvania Coordinator of Occupational Competency Assessment and with Mr. Harry Kraft, Assistant Professor and Coordinator of Occupational Competency Assessment at The Pennsylvania State University. Each provided invaluable help in assessing all phases of current information on ideas and programs of occupational competency assessment. These interviews also served as a frame of reference for discussing and developing new and improved recommendations and procedures needed in developing valid and reliable programs of occupational competency assessment at the state and local levels.

Data Gathering

The data used in the study was obtained from a review of the current literature, and samples of forms and procedures used in Pennsylvania's occupational competency assessment program, and through personal involvement and interviews while working as a half-time graduate assistant in the area of occupational competency assessment in the Division of Occupational and Vocational Studies at The Pennsylvania State University. These key experiences were the basis upon which the development of a series of proposed recommendations and procedures for the administration of a centralized program of occupational competency assessment were made.

Data Analysis

Each section of the series proposed recommendations and procedures used in a program of occupational competency assessment were formulated separately according to information obtained as it related to actual examples and working forms that were used in conducting an occupational competency assessment program.

The development of each section of recommendations and procedures was built upon one another in a progressive form until a complete series of recommendations and procedures was formulated.

Chapter IV

FINDINGS

Introduction

The success of vocational programs depends upon the right kind of teacher in possession of the right kind of occupational competency. (Panitz, 1975) This has brought about a growing concern over the need for measures to accurately evaluate occupational competency.

The proper objective of a competency examination is to pinpoint the particular skills and knowledge needed for a given situation and devise a method for evaluating those qualities. Any quality not specifically called for should be kept out of the testing process as its presence can only lesson the validity of the instrument. In order to accomplish this, one must design a test that minimizes verbal skills. (Comer, 1971)

The procedures involved in developing and operating a centralized program for occupational competency assessment, and developing valid written and performance testing instruments cannot be carried out without strongly affecting one another.

"Knowledge of," is really an essential ingredient for doing a complex job correctly, but while it is a necessary condition, it is rarely a sufficient condition for satisfactory performance. (Boyd, 1971) A person may be able to bluff a singular oral examination or written test, but he/she can seldom carry on a deception when a realistic performance test is required. One of the great virtues of the performance test is that it has impressive "force validity" and credibility because the task

so closely resembles the job itself. (Boyd, 1971) The importance and use of simulated or job based performance test which measures a candidates psychomotor skills cannot be overemphasized.

The successful development and use of a performance test, when combined with a valid written test that accurately measures the cognitive knowledge required in a specific occupation, is the primary goal of occupational competency assessment. Evaluations that include appropriate performance testing as well as written examinations will usually result in a more dependable overall candidate assessment than either type of evaluation used alone. (Boyd, 1971)

In the following recommendations and procedures it is hoped that the reader will not only gain an understanding of the process involved in developing a centralized program of occupational competency assessment. But also a greater appreciation for the need of valid and reliable written and performance examinations in all occupational areas.

This is an eight part series of recommended procedures for developing and administering a statewide center for occupational competency assessment. Information used in developing these materials was obtained through an extensive review of the literature, forms and examples of documents used in the Pennsylvania program for occupational competency assessment, actual interviews with persons currently working in the area of occupational competency assessment, and through experience obtained while working as a half-time graduate assistant in the Division of Occupational and Vocational Studies at The Pennsylvania State University in the area of occupational competency assessment.

The recommended procedures for developing and administering a statewide center for occupational competency assessment that will be explored in this chapter are:

1. Funding and proposal guidelines for a program of occupational competency assessment.
2. Development of a centralized office for occupational competency assessment.
3. Procedures for evaluation of the candidate in occupational competency assessment.
4. Coordination and Use of National Occupational Competency Testing Institute Examinations.
5. Procedures for development of written occupational competency examinations.
6. Procedures for development of performance occupational competency examinations.
7. Procedures for test development and test examiner workshops.
8. Procedures for maintenance and improvement of occupational competency assessment.

Procedure 1 Funding and Proposal Guidelines for a Program of Occupational Competency Assessment

The main objective of occupational competency is to evaluate, equate and accredit education and experiential backgrounds of the candidate in the most effective and efficient manner possible. To assure that the development, use, and dissemination of occupational competency assessment is properly conducted requires the services of professional personnel and a statewide center for occupational competency assessment.

Development and operation of a statewide program for occupational competency assessment requires financial support from the two major bodies it serves: the vocational-technical candidate who is seeking verification of his/her occupational skills; and the State, which has the responsibility of providing assurances that quality vocational-technical instruction is conducted in its programs and institutions. Thus, an occupational competency assessment program is funded in part by basic funding from State and Federal sources, and in part by tuition and various cost recovery fees from the candidate, including the occupational competency assessment fee. (BVEPDE, 1977)

Since both the state and vocational-technical candidate play such a vital role in funding and dependence upon each other in making a program of occupational competency assessment and quality vocational-technical education possible, it is recommended that a certificate of occupational competency (according to occupational area) be granted upon successful completion of an occupational competency examination. This certificate will provide the candidate proof of competency in his/her particular occupational area and it will provide the state with a method of screening and verifying occupational competent vocational-technical instructors (see Appendix A, Example 1 for certificate sample).

Funds that are received from the candidate are not collected to make a profit but to operate on a break even status in regard to the program cost per individual assessment. The cost to the candidate will depend upon the type of examination given: written, performance, oral, credential evaluation, or a combination of types; and upon the time frame in which the candidate is examined: regular scheduled exams or emergence

examination. See Appendix A, Example 2 for a detailed breakdown of an occupational competency assessment fee scheduled and recommended candidate fees for the 1978 testing cycle. It is important to point out the fact that the cost of administering an individual assessment is the same whether the candidate passes or fails. For this reason a resume of program cost for candidate examination assessments is included in Appendix A, Example 3. This resume shows the importance of keeping a record of candidates assessed for each fiscal year in determining the program cost per individual assessment. Accordingly, this information can then be used to justify program cost of occupational competency assessment, and to adjust candidate fee schedules for the coming fiscal year, if appropriate. Basically it should be recognized that the cost assessed the candidate for an occupational competency examination is minimal and supplies funds only for the operational procedures in test administration, not for test development, improvement, or updating.

If candidate fees will not cover the cost of candidate assessment or the important aspects of test development, improvement, or upgrading, then funds must be provided from other sources. Because of the vital importance and service of occupational competency assessment to the state, additional operating costs should be proposed and funded by the state. Proposing and funding a centralized statewide program of occupational competency assessment is crucial during the initial years of its operation. However, it should also be stressed that after the center has been established and operating efficiently for a period of not more than two or three years, it should receive financial support from the state as a regular operating and vital part of its educational expenditures without the need for proposal funding on a yearly basis.

When writing a proposal for funding a statewide center of occupational competency assessment the writer should follow the guidelines for project funding in the state in which he/she is applying for funds. If no specific guidelines are available the following recommendations as interpreted from the publication, "Special Guidelines for Project Funding 1977-78, Vocational Education Personnel Development" by the Pennsylvania Department of Education, should be an important source of reference (Appendix A, Example 4).

Assurance of compliance with the Civil Rights Act of 1964, Act VI is essential to the receiving of federal funds. Also compliance with the Secretary of Education's policy on Sexism in Education should be recognized and followed in writing a proposal for occupational competency program funding.

The budget should be categorized in accordance with the types of expenditures included in the guidelines (Appendix A, Example 4) and should explain clearly how each amount was computed or estimated. All budget cost figures should be rounded to the nearest dollar.

After the proposal abstract and budget has been developed, considered, and refined, the project director should prepare and submit a fully developed proposal. Recommended guidelines for this proposal development are briefly outlined below and explained in more detail in Appendix A, Example 5.

Proposal Outline

1. Need
2. Objectives
3. Procedure
4. Personnel

5. Facilities
6. Evaluation and Reports
7. Dissemination
8. Financial Support
9. Budget

Procedure 2 Development of a Centralized Office for Occupational Competency Assessment

A statewide centralized office for program administration of occupational competency assessment is a valuable tool for vocational-technical education if developed and conducted effectively and efficiently. The state occupational competency examination office and program administrator should act as a coordinator in representing and serving the needs of the vocational-technical candidate, the state educational agencies and institutions, and the National Occupational Competency Testing Institute. These representative bodies are directed to the goal of establishing and providing quality vocational-technical education for all persons.

After the need for a program of occupational competency assessment has been decided and a proposal for establishing the program submitted and approved the next step involves the development of an occupational competency assessment center. The development of the center must include:

1. Establishment of facilities
2. Personnel to operate the program.
3. Development of policies for program efficiency and effectiveness.
4. Establishment and maintenance of filing and record keeping devices.

The establishment of facilities largely depends on funding available and requirements established in each state. However, the research and interviews conducted has shown that an effective occupational competency assessment center will be located according to the following recommendations:

1. Establishment of the occupational competency assessment center as close to the states geographical, educational, and population base centers as possible.
2. Utilization of university or state facilities for program location only when cost of such facilities does not exceed the cost of a private office or building that can be managed by the competency assessment center.
3. The facility should be located in such a manner that ease of access, parking and material handling will be facilitated.
4. The facility should be large enough so that all necessary functions, personnel, materials, and storage can be centralized and supervised in an efficient manner.

Personnel selected for occupational competency assessment duty should be carefully screened and chosen on the basis of their professional ability, trust and commitment toward the singular goal of establishing and operating a confidential program of occupational competency assessment to the best of their ability. The accreditability and reliability of occupational competency examinations and certification largely depends on the personnel with whom the system is intrusted. The personnel necessary for optimum development of an occupational competency center are:

1. Program Administrator--this persons duties and responsibilities involve total supervision of the states occupational competency assessment program, test development, and supportive staff.
2. Occupational Assessment Coordinator--this person acts as an assistant to the program administrator and is primarily responsible for publicizing test, counseling potential applicants, admitting and approving applicants for assessments, arranging for assessment facilities and examiners, and reporting examination results to the assessed candidates. (BVEPDE, 1977)
3. Occupational Assessment Secretary--this person or persons plans a vital part in routine clerical activites, compiles all documents necessary for evaluation, supplies files to the coordinator when ready for review and decision, prepares exams, scores exams, and various test related duties. (Funk, 1977)
4. Occupational Experts--these are craft persons and professionals who are experienced and certified in a specific trade area. They are resource persons that are paid an honorarium for their participation in various duties relating to occupational competency assessment.

The next step in establishing a centralized program of occupational competency assessment involves developing a list of policies for program efficiency and effectiveness. These policies may vary according to individual and state program needs. However, a list of recommended policies should include:

1. Establishment and operation of a single development and distribution center for competency examinations in the state.
2. Designation of personnel who's only tasks relate to the development and goals assigned to the occupational competency assessment center.
3. Confidentiality and security of occupational competency assessment materials must be kept at all times.
4. Coordination and use of standardized test (NOCTI) when possible.
5. Close screening of candidates for occupational competency assessment.
6. Development of standardized practices in test development.
7. Central printing of all testing materials.
8. Development of a state policy manual for central administration of the occupational competency assessment program (see Appendix B, Example 1).
9. Development of procedures for maintenance and improvement (See Appendix H, all examples).
10. Development of a master list of all vocational technical courses approved for instruction in the state by title, certification number and United States Office of Education Code (See Appendix B, Example 2).
11. Development of punched answer keys for each approved occupational competency assessment (See Appendix E, Example 8).
12. Development of diagnostic overlays to permit immediate determination of candidate strengths and weaknesses (See Appendix E, Example 7).

13. Compilation and publication of occupational data and scope of individual examinations (See Appendix C, Example 4).
14. Preparation of pre-tests for each test area (See Appendix C, Example 3).
15. Preparation of a check list of candidates experience to improve counseling (See Appendix C, Example 2).
16. Workshops for test development and test examiner personnel for standardization and test validity (See Appendix G, All Examples).

The development of policies and forms for occupational competency assessment is a continuous process that will refine and improve the occupational competency centers role and functions in the future.

The final step in development of a centralized office for occupational competency assessment is the establishment and maintenance of record keeping files. This can be done through the use of four separate filing systems that can be used and updated in a sequential form. First, a file is established for storage of a master copy on each occupational examination by the approved industrial-vocational test title. Within each master title is a folder containing:

1. A master copy of the written examination
2. A master copy of the examiners copy of the performance examination
3. A master copy of the candidates copy of the performance examination
4. A pre-punched standardized answer key for the written examination and pre-test

5. A transparent diagnostic overlay of the major occupational areas on the written examination
6. A master copy of a pre-test and candidate's experience check-list
7. A competency evaluation form for examination maintenance of the master file

Second, a number two file is established for current test center use. This file should have four current copies of the written examination, examiners performance examination, candidate's performance examination, candidate's pre-test and candidate's check-list by approved test title, and one copy of the written answer sheet, pre-test answer sheet, and diagnostic overlay. These materials are used and later returned when actually administering occupational competency examinations during the testing schedule.

Third, a number three file is established according to the master test file o.der with individual folders for each occupational area. These folders contain information on test development or updating in the written or performance examination, answer sheets, diagnostic overlays, or pre-assessment test and checklist.

Finally, a number four file is established for storage of tests that have been retired and are no longer being used according to approved test title. These tests will be destroyed if not revised or used within a period of five years.

It is important to emphasize that all tests are filed alphabetically according to the approved test title and should be kept in a locked file cabinet when not in use. Authorized occupational competency personnel should be the only persons allowed access to the keys or files at any time.

Procedure 3 Procedures for Evaluation of the Candidate in Occupational Competency Assessment

After a program and center for occupational competency assessment has been established the prospective candidate emerges as the central figure. Whether the candidate expresses an interest in applying for the occupational competency examination because it has been mandated by the state for vocational instructional certification, because he/she has a personal interest in proving occupational competency in a specific occupational area, or for other reasons. The fact still remains that the prospective candidate needs to be informed of the how, what, when, and where behind occupational competency assessment.

Because the primary air of occupational competency examinations leads to the assessment of candidates who will be instructing some form of occupational or vocational-technical education area there lies a common bond between vocational-technical teacher training institutions, vocational-technical schools and the prospective candidate. For this reason the first step in candidate assessment is to make him or her aware of occupational competency evaluation through self-explanatory brochures that are sent out to every agency or institution that has any connection with vocational-technical education. Through these brochures the candidate can acquire information about occupational assessment in regard to:

1. Authorization
2. Eligibility Requirements
3. Employment Experience Guidelines
4. Application Forms, Fees

5. Credentials
6. Examination/Evaluation
7. Re-examination

(see Appendix C, Example 1 for brochure details)

After the candidate is aware of and instructed in occupational competency assessment his/her next step would require a visit to the state center for occupational competency assessment. Here he or she would counsel with the occupational assessment coordinator to determine the prospective candidates career interest, amount and type of work experience, educational background, and be advised on further details concerning application for admission to occupational competency assessment. (BVEPDE, 1977) At this time the coordinator should be able to adequately assess the candidates occupational experiences through the use of a checklist for candidate experiences (see Appendix C, Example 2) and through an on the spot administration of a 30 question pre-test (see Appendix C, Example 3). Both of these assessments have been developed by certified craftspersons in their respective areas of occupational expertise and provide an effective screening tool for the coordinator. These immediate feedback of results will supply the coordinator with counseling information to advise the candidate whether or not to take the test. In addition, the checklist can serve as a bases for suggestions to the candidate in strengthening weak areas he or she may have. The coordinator also has a Scope of the Exam booklet which provides a description of the work involved and certification method used according to instructional title and occupational area of testing (see Appendix C, Example 4) and a percentage breakdown with sentence description of the written and

performance aspects of each occupational competency examination (see Appendix C, Example 5). This information can be given the candidate for use in studying and preparing for the occupational competency examination.

After the candidate has been interviewed and approved by the coordinator for authorization to enroll for the occupational competency examination he/she must complete an application for enrollment during the next testing period. The application will either be a NOCTI or individual state form depending upon the test given, and in either case it will be a descriptive form requiring each candidate to list and verify educational and work experience applicable to the title of the occupational competency examination for which he/she is applying. Verification of high school degree or equivalent, sufficient employment experience beyond the learning period, and other educational qualifications may be required and should be received by the coordinator at least 30 days before the date the examination is to be administered (see Appendix C, Examples 1, 6 and 7).

It must be pointed out that the coordinator is the sole person in charge of assessing and authorizing the candidates eligibility for the test. With the advents of civil rights legislation the candidate has the privilege of challenging this decision and taking the examination if the coordinator does not find the candidate acceptable on the basis of his or her educational and work experience credentials. However, in the majority of instances the coordinator's judgement has proven correct and the failure rate is high among candidates on a test that he or she has pursued without the proper qualifications. This failure results in additional proof of worthiness, work experience and testing fees before re-examination is granted.

After the candidate has been approved and verification of work experience, educational credentials, and fee payment have been received the coordinator must notify the candidate by first class mail of admission or non-admission 15 days before the examination. This admission notice must include the precise assessment title chosen; the method of assessment; and the exact time, date, day, and place of the examination. (PVEPDE, 1977) This notice should be followed up by a phone call five to seven days before the examination to confirm this information with the candidate.

If a candidate wishes to withdraw from an examination, he/she must notify the occupational competency center two full working days before the test hour, the center will then refund the candidates fee less any unrecoverable expenditures already involved. There are no exceptions to this rule or further refunds unless the withdrawal occurred as a result of the centers error. (BVEPDE, 1977)

The candidate should be notified of examination results approximately 30 days following the examination date. Notification of the examination results to any person other than the candidate without written permission from the candidate is prohibited. (Kraft, 1977)

If the candidate fails an examination he/she may be recommended for a re-examination only after he/she has: obtained a minimum of six months to one additional year of wage earning experience in the occupational field of training being assessed; paid the additional fee for the re-examination; and been approved by both the coordinator and director of the occupational competency assessment center. Only two assessments are allowed in the same occupational title of assessment. The director of the occupational competency assessment center must have the final authority in hearing any appeals for re-examination.

Procedure 4 Coordination and Use of National Occupational Competency Testing Institute Examinations

The National Occupational Competency Testing Program grew out of a three year research and development project supported by the U.S. Office of Education. (NOCTI, 1977) In 1973 the National Occupational Competency Testing Institute (NOCTI) was formed as a nonprofit corporation, and is governed by and presently consists of a Consortium of 45 states.

Because of the national importance of NOCTI to industrial vocational-technical education and to occupational competency assessment it is of vital importance that the state center for occupational competency assessments work as closely and completely with NOCTI as possible. This cooperation will aid in strengthening both centers and provide efficient and effective use of occupational competency examinations.

The NOCTI examinations are very similar to those examinations which a state center wishes to develop and use in trade areas not presently covered by NOCTI. Presently NOCTI covers 26 vocational-technical areas for competency assessment, (see Appendix D, Example 1 for test titles and NOCTI order form). Each of the NOCTI examinations has two parts: a written test of approximately 180 to 200 multiple choice questions, and a performance test of approximately three to four hours in length which measures the skills, methods, and procedures of the occupation a candidate is being examined for. (NOCTI, 1977) The test center should use NOCTI examinations when available for the appropriate occupational area being assessed in support of the efficiency, effectiveness and recognition NOCTI can bring to occupational competency assessment.

The NOCTI examinations should be administered during the designated testing cycle of the state center and according to the state centers rules for candidate evaluation and examination. The state occupational competency assessment center should keep one current copy of each NOCTI examination by test title in its master file for emergency examination use only. The state center director should sign for and be responsible for the security of the NOCTI examinations on file. It is suggested that the fee for NOCTI examinations be assessed at a standard rate per examination title to the state occupational competency assessment center. It is recommended that the fee for the candidate being assessed by a NOCTI examination will be the same as the fee for all state center occupational competency assessment written and performance examinations regardless of occupation or exam title.

After the candidate has been evaluated and authorized to take a competency examination that falls under the NOCTI test titles, the state center should request and receive the designated competency exam no later than 15 working days prior to the examination date (see Appendix D, Example 1 for a copy of the NOCTI Examination Order Form). The state occupational competency assessment center should also keep on file a supply of the following NOCTI materials: Bulletin of Information for Candidates, Registration Forms, and Order Forms for NOCTI Test Materials (see Appendix D, Example 2 for a sample of the Order Form for NOCTI Materials).

The approved candidate should receive a scope of the exam which describes the major areas of the written and performance NOCTI examination he/she will be administered according to the occupational test title (see Appendix D, Example 3). At this time the candidate must also

receive a NOCTI examination registration form and a copy of directions for completing a NOCTI registration form (see Appendix D, Example 4 and 5). These forms must be completed, verified and sent to the state center coordinator according to the established deadlines for all state occupational competency assessment forms and fees. Candidate withdrawal and refunds of NOCTI exams will also follow established occupational competency state center guidelines.

After the candidate has been assessed both the written and performance examinations, the used test, and unused test should be forwarded to NOCTI for scoring, diagnosis, and reporting. (BVEPDE, 1977) These results will then be sent back to the state competency assessment center, who is responsible for notification of results to the candidate according to established state center reporting procedures. Although NOCTI scores each examination and designates pass or fail status, each state center makes the final determination of acceptance and validity of the candidates pass or fail status just as it does for all approved occupational competency assessments administered within its authority.

Re-assessment of NOCTI examinations will follow the same standards and guidelines established for all occupational competency assessments approved by the state center.

NOCTI information and material that should be kept on file and understood by all personnel at the state occupational competency assessment center are:

1. Bulletin of Information for Candidates
2. Registration Forms
3. NOCTI Brochure (Extended Your Future)
4. NOCTI News

5. Handbook for Area Test Center Organization and Administration
6. Cumulative National Norms
7. NOCTI Constitution
8. Order Form for NOCTI Text Materials

Procedure 5 Procedures for Development of Written Occupational Competency Examinations

The history and importance of written examinations in all fields of testing is an extensive and widely used method of evaluation. Paper and pencil tests are objective, can be administered easily and the results can be scored and reported easily and rapid. (Panitz, 1975) While progress in the measurement of verbal skills, facts, and information has been substantial attempts at evaluating occupational skills and know-how by using written test or performance test have been relatively limited. (Panitz, 1971)

For the measurement of occupational proficiency it is essential to administer both performance and written tests. The written and performance portions of the occupational competency examination must be developed together to insure complete validation of the competencies. (Karwaski, 1975) While performance tests, in general, are more likely to be job-like than pencil and paper tests, certain aspects of information, facts, computations and interpretations can be more effectively measured through written test. (Panitz, 1971) The content of written tests should include the following areas of occupational competency:

1. The factual knowledge and technological (trade theory) information of the occupation.
2. Knowledge and understanding of the machines, tools, instruments, and apparatus of the occupation.
3. The properties and characteristics of materials and the parts, or systems, which are diagnosed, processed and replaced.
4. The necessary calculations required for setting up adjusting, testing and operating the machinery, apparatus, and test equipment used in the occupation.
5. The reading and interpretation of specifications, technical drawings, wiring and circuit diagrams, and other graphic representations.
6. The interpretation of scientific principles as they apply to the design and/or operation of machines, apparatus, instruments and the processing of materials, component parts and accessories.
7. Judgements and procedures involved in planning the work of the occupation, selection of materials and/or the replacement of component parts.
8. Classification of materials, component parts and specific tools; instruments and supplies.
9. General knowledge and work habits of the occupation, as well as specific requirements relating to occupational safety and hygiene, government regulations, and other conditions surrounding the occupation. (Panitz, 1971)

The written test covers the kinds of knowledge gained on the job (rather than from text books), technical and factual knowledge, understanding of principles and problem solving abilities. (NOCTI, 1977) The first procedure in written test development for occupational competency assessment requires the choosing of the type of test that will be developed. It is recommended that multiple choice test items be used exclusively in written test development. This will provide for standardization of formulating, administering, scoring and validating of occupational competency examinations. Multiple choice test items consist of two distinct parts: 1) the stem and 2) the choices. The stem may be in the form of a direct question, an incomplete statement, or a problem. The choices, often referred to as "answers," may consist of single words, phrases, sentence completions, whole sentences, numbers, illustrations, or diagrams. The candidate is to select the best or correct choice in accordance with the directions given in the "heading" of the examination. (Williams, 1970)

Briefly stated advantages to multiple choice items are:

1. Scoring is easy.
2. The guessing factor is reduced.
3. Examinees are usually well acquainted with this type of question.
4. Can measure the candidates ability to interpret.
5. Can measure the candidates ability to discriminate.
6. Used to measure what can be recognized.
7. Can measure the candidates understanding of items relating to: Definition, Purpose, Cause, Effect, Association, Error, Evaluation, Differences, Similarity, Arrangement, and Controversial Subjects. (Williams, 1970)

The second procedure in developing written occupational competency assessments is development of the test questions themselves. Since the type of question chosen is multiple choice questions the writer will briefly describe the procedure for developing multiple choice questions.

First the "stem" or "body" of the question is developed. The stem should: contain a central problem, must be stated clearly; should be worded in the briefest manner possible; avoid particular words as specific determiners; underline words which characterize the item; use illustrations whenever possible; and be grammatically correct. (Williams, 1970) The following is an example of a stem or body of a question:

_____ Four-inch square tiles are set in the floor of a room 12 feet by 10 feet. How many tiles are required?

The response to this question is referred to as "choices" or "answers." The choices should: be listed in outline form; be arranged so that the correct one does not occur in a recurring pattern; if choices are a number, put them in order; avoid making the correct response of an item longer or shorter than the others; avoid repetition of words and phrases in the choices; and variation should be employed in the selection of types of multiple choice items used. (Williams, 1970) The following is an example of a series of choices for the previous stated question:

A. 1040

B. 1060

C. 1080

D. 1100

Candidates that solve the problem would indicate the correct choice by darkening the circle under the letter of his/her choice on a standardized answer sheet provided.

Now that the proper method of written testing has been determined and method of development understood, the procedures of actual written test development in occupational competency assessment can be successfully carried out. A written occupational competency should be developed for each approved trade test title that is not being serviced by a NOCTI examination. The centralized state test center must solely be responsible for determining and developing these written examinations. It is recommended that a specified number of tests be developed each year depending on the staff and facilities available. Each written and performance test must also be reviewed and revised if necessary on a five year test improvement cycle.

The development of written occupational competency exams involves a very extensive process and can be carried out according to the following recommended procedures:

1. Determine the amount and approved titles of tests to be developed or revised each year.
2. Choose and train a panel of two to four certified experts in each respective trade test occupation to be developed. This will aid in determination of the desired cognitive knowledge and manipulative skills required for assessment on the written and performance test.
3. Develop approximately 300-400 questions in each approved trade test according to the occupation percentage breakdown listed in the Scope of the Examination booklet for that specific trade area. This will assure an ample amount of questions for a valid 180 to 200 question pre-test and a list of alternative test questions.

4. Validate the questions developed by selecting and visiting vocational-technical training institutions throughout the state and actually administering these questions to select instructors and seniors in the area of the occupation represented by the trade test title. Assessment of 40 to 50 persons on each trade test area will provide a base by which each question can statistically be validated. This testing can also supply mean scores for future candidate assessment and comparison. It should be noted that a folder should be established when conducting the validation study for written occupational competency examinations. This booklet should include the following material:

    A. A sectional breakdown of each school visited in conducting the validation study. Each section will contain a form showing occupational areas which were selected for validation at the school (see Appendix E, Example 1).

    B. A copy of the letter sent to the schools to request authorization for conducting validation studies (see Appendix E, Example 2).

    C. Instructions for test administration of validation examinations. These instructions are:

        1. Pass out scan sheets, tests, pencils, scratch paper.
        2. Explain marking of Scan Sheets.
        3. Explain turn-in of material.
        4. Complete test.

All unused scan sheets, completed scan sheets, test, and expense vouchers are to be coded and placed in separate envelopes.

D. Instructions for coding scan sheets will also be necessary since the scan sheet categories will be interpreted differently for validation study use.

Code Interpretation

Student - Female

Teacher/Tradespersons - Male

Test Title Number - Code two digits in columns five and six (equal to the special code of the occupational area being validated) of special codes section

Social Security Number - remains the same

E. A pre-punched answer key of the validation examination. This is used to score and inform the teacher/tradespersons of his or her results.

5. Select, arrange, and develop the master written occupational competency exam questions according to the percentage breakdown of the trade test area on the scope of the exam and to the prescribed question validity established in the validation study. The master test should be 180 to 200 questions long and will be proceeded by: a cover page stating the approved name of the test and U.S.O.E. or state certification code numbers; a title page stating the words Written Examinations; a page describing occupational competency examination written test instructions to the candidate;

and a title page of questions which begins with directions for answering the questions (see Appendix E, Examples 3, 4, 5, and 6).

6. Reproduce, collate, assemble and file the developed test. The master copy to the file, four printed copies to the number two file, and all materials used in development of the master test and spare questions to the number three file.
7. A standardized occupational scan sheet should be used as a general purpose answer sheet for written examinations. A master copy and two punched answer keys must be prepared for each occupational test area (see Appendix E, Example 7).
8. Finally a transparent diagnostic overlay which outlines the optical scan sheet according to the major occupational divisions of each written examination should be prepared and filed in the number one master file (see Appendix E, Example 8).

Finally, the new written occupational competency examination should be filed and ready for use. It should be noted that the established passing or failing mean score for each written test will be different depending upon the specific trade test area, and that a standard deviation of five points lower than the established mean will generally establish the failing cut-off point on a written examination. It should also be noted that all written examinations for a specific examination period are given on the same day, in the same facility (usually the occupational exam center), and by the occupational competency assessment center coordinator or staff. This provides for standardization, efficiency and validity of written competency examinations.

Procedure 6 Procedures for Development of Performance Occupational Competency Examinations

Measuring performance is nothing new. For centuries it has been done informally by teachers in schools, by craftspersons responsible for the training of apprentices, and by foremen in industries. (Boyd, 1971) This informal method and verification of a persons performance ability in a specific occupation or trade was acceptable in times when operations and jobs were conducted on a small and relatively simple scale. However, modern levels of job requirements and performance standards are so varied and far reaching in their implications to the world of work today that a need for formal assessment of a persons ability to perform a job has become a crucial issue. Attention has and is being given to measuring a persons ability to meet performance standards required in an occupation through written examinations. Although, there is a greater concern to find out whether the person can meet certain performance standards by doing a specific task. For this reason it is believed valid performance tests need to be developed that identify objectives and devise techniques for measuring the objectives of vocational-technical jobs or occupations. (Boyd, 1971)

A performance test is a test designed to analyze and measure a candidates skill in the performance of selected operations under rigidly controlled conditions. (Texas A&M, 1970) Performance test uses and advantages are:

1. To provide an objective reliable and valid measurement of a candidates ability to perform certain operations that cannot be obtained by any other means.
2. Provide a careful analysis and measurement of the extent to which a candidate has mastered various elements of skill.

3. Enables the candidate to analyze his/her own strength and weaknesses.
4. Measure the result of instruction in the direct application.
5. Can be combined with situation problems to measure judgement.
6. Tests the candidates ability to perform.
7. Evaluates specific knowledge and understanding along with manipulative work.
8. Stimulates development of skills.
9. Provides for a more comprehensive evaluation of the candidate. (Texas A&M, 1970)

The test center that realized these and other important aspects of performance testing can stress the development of performance tests with written evaluations in developing a total instrument of occupational competency assessment. It is recommended that written and performance examinations be used in assessing all occupational areas on a 50-50 basis in competency assessment.

After the need has been clearly defined and determined, a method for developing occupational competency performance examinations must be established. Some individuals believe that any performance test in which tools are used, a machine is operated, parts are checked and replaced, or things are manipulated, represents a satisfactory performance test. Such a test may appear to have a great deal of face validity, however, this does not measure the intended purpose or real validity of the test. (Panitz, 1971) Unless great care is taken: in the use of a job analysis; and competent experts in the occupational trade test area to be developed are used to determine those skills and methods which are vital to the job

performance; and provision is made for step-by-step procedural planning, standardization of administration and objectivity in scoring; the test can easily become an unreliable instrument. (Panitz, 1971)

The statewide center for occupational competency assessment should establish its own method for developing written and performance instruments used in assessing occupational competency so that standardization and efficient use of these instruments can be developed. A recommended list of procedures used in developing valid and reliable occupational competency performance examinations reads as follows:

1. The first and usually the most difficult task is deciding what jobs or tasks should be used in the performance examination. This can be accomplished through a team of three or four certified instructors or experts in the occupational area to be tested by deriving a careful job analysis of the trade area. The analysis includes information about: training; responsibility; job knowledge; mental application; dexterity and accuracy; and equipment, material, and supplies. (Panitz, 1971) This job analysis can then be broken down into the most important tasks which are vital to successful performance in the jobs and trade area as a whole. These tasks should then be included in a percentage breakdown of specific jobs or operations which will make up 100 percent of the performance tests for an occupational trade area, (see Appendix F, Example 1 for a proportioning work sheet used in written and performance tests).

2. The tasks and operations that have been determined as vital to successful occupational performance must be formulated into a feasible and functioning performance examination. This examination must be broken down into two major sections although the same performance processes and products are being assessed. These two sections are an Examiners Copy of the performance examination and a Candidates Copy of the performance exam. The examiners copy must be more detailed for the purpose of assessing the candidate and includes the following sections:

   A. A cover sheet stating, Performance Test, Examiners Copy (see Appendix F, Example 2).

   B. An examiners report sheet which the examiner uses in listing a subjective evaluation of the candidate (see Appendix F, Example 3).

   C. A job description which gives an explanation of the operations, procedures and tasks involved in the occupational area to be tested (see Appendix F, Example 4).

   D. A general statement of examiners instructions relating to the occupational trade test being assessed, a description of the scoring process, and a statement relating to the candidates safety evaluation sheet (see Appendix F, Example 5).

   E. A detailed breakdown of the material, equipment, and tools which are required in conducting the performance examination according to the occupational trade test (see Appendix F, Example 5).

F. An examiners directions sheet which gives a detailed description of each job to be performed by the candidate. This is accompanied by an examiners copy of the job drawing when appropriate. Each job description includes the job number, title, normal completion time, materials, tools, equipment, safety/accident prevention, directions, and scoring for that job (see Appendix F, Examples 7 and 8).

G. A concluding performance evaluation sheet that lists the major scoring breakdown and score attained in each performance job on the total test (see Appendix F, Example 9). The candidates copy describes the same jobs or tasks as the examiners copy except only the essential information the candidate needs to know for completion of the job is given. The candidate's copy includes the following sections:

1) A cover sheet stating, Performance test, candidates copy (see Appendix F, Example 10).
2) A standard information sheet which describes performance test instructions to the candidate, (see Appendix F, Example 11).
3) A safety evaluation sheet which the examiner has to complete on the individuals safety consciousness directly related to his/her trade (see Appendix F, Example 12).

4) A list of general instructions to the candidate describing guidelines for interpretation of the specific occupational performance test he/she will take (see Appendix F, Example 13).

5) A candidates directions for job sheets which give detailed descriptions of each job to be performed by the candidate. This is accompanied by the candidates copy of the job drawing when appropriate. Each job description includes the job number, title, candidates name, candidates number, special directions, assignment (with normal completion time), time started and finished, and a job number score (see Appendix F, Example 14).

3. Once the tests have been developed the master copy of the examiners performance tests and candidates tests are placed in the master file according to occupational trade test title. Four copies of the examiners and candidates tests are reproduced at the state center and placed in the number two file for tests used. All remaining materials and information relating to the examiners and candidates performance examinations should be placed in file three according to trade test titles.

4. All occupational performance examinations should be reviewed and revised at least once every five years for current validity and reliability.

It should be mentioned that all written and performance examinations should have a high correlation rate, and that these tests should only be developed by occupational competency center staff and competent occupational craftsmen and technicians that have taken and passed the state competency centers test developers workshop. It should also be noted that occupational performance examinations are given on a designated Saturday after the written examinations and usually administered at the school shop or lab in which the test examiner works.

Procedure 7 Procedures for Test Development and Test Examiners Workshop

The importance and proper development of written and performance occupational competency examinations is the basis of a sound and valid system in competency assessment. However, the fact remains that this form or any form of assessment is only as good as the persons who develop and administer the examinations. For this reason, the writer would like to briefly describe the occupational competency centers responsibility and role in choosing and preparing test developers and test examiners for occupational competency assessment.

The statewide occupational competency center's role of assessing vocational-technical personnel cannot be accomplished without the help of competent craftspersons and technical workers from all occupational areas. Whether assistance is needed in test development or examination, the standards of vocational-technical personnel should be the same. The director of the occupational competency center should constantly strive to find test developers and test examiners with the following qualifications:

1. If possible he/she should be approved or certified in his/her trade area of occupational competence by the state and/or competency test center.
2. Possess a minimum of six full-time years of work experience in his/her respective occupational area.
3. Possess a minimum of three years full-time teaching experience in his/her respective occupational area.
4. Have successfully completed and passed the occupational competency assessment in his/her respective occupational area.

Once the test developer or examiner candidates have been contacted and approved, they should attend and successfully complete the state centers occupational competency test development and/or test examiners workshop. Many times a candidate is willing to and should serve in both areas of need. The occupational competency assessment center should establish a standardized set of procedures for the test development and test examiner's workshops and supply a certificate of accomplishment to each candidate who successfully completes each workshop.

The procedures for test development workshops are as follows:

1. First, a need must be determined as to which occupational trade areas need new tests developed or outdated tests revised. Then the director must identify and contact three or four competent vocational or technical personnel in each trade test area to be developed and scheduled a workshop for training these men or women the procedures and methods needed to develop written and performance based occupational competency examinations.

2. Each test development candidate should receive an honorarium of $50 for attending the two day workshop plus travel expenses to and from the workshop to their place of residence. They should also be reimbursed for meals and lodging (if required) in conjunction with the test centers financial policies. All expenditures must be recorded on the state centers travel expense voucher and accompanied by necessary receipts (see Appendix G, Example 1).
3. The test development workshop should cover all areas of written and performance occupational competency test development with examples and representative copies of documents needed and used in test development whenever possible (procedures 3, 5, and 6, and Appendix C, E, and F can be used as references and examples for the content needed and used at test development workshops). These references should be used to develop a test developers workshop booklet.
4. The major areas that the candidate for test development must learn are:
   a. Candidate Checklist of Experiences
   b. Candidate Pre-Test
   c. Candidate Written Multiple Choice Examinations
   d. Candidates Copy Performance Examinations
   e. Examiners Copy Performance Examinations

5. Test development candidates who successfully complete the workshops are issued certificates of proficiency making them eligible to develop occupational competency assessments and related materials in their respective area of occupational expertise.

Procedures for development of examiners workshops by the state center are as follows:

1. First the center must decide which approved occupational competency testing areas need new or retrained performance test examiners. Then the center must find the persons that best meet the standards established for test developers and/or examiners who are willing to perform the function of a test examiner. These persons should then be contacted as to the place and time of the test examiner workshop.
2. Each test examiner candidate will receive an honorarium of $25 for attending the one day workshop plus travel expenses to and from the workshop to their place of residence. They should also be reimbursed for their meals in conjunction with test centers financial policies. All expenditures must be recorded on the state centers travel expense voucher and accompanied by necessary receipts (see Appendix G, Example 1).
3. The examiner workshop should cover only the areas of performance examination because the written examinations will be given at the test centers facilities on one given day regardless of the trade area being assessed by the occupational competency assessment center coordinator. The examiners

workshop should describe the information covered in performance examination procedures stated in sections 6 and Appendix E. A booklet should be developed from this reference for use in test examiners workshops with particular emphasis placed on the "Examiners Copy" of the performance test. Reference should also be made to encourage unbias attitudes among performance examination examiners in such areas as:

a. Sex

b. Race

c. Nationality

d. Dress or appearance (when not conflicting with safety regulations)

4. Performance assessment examiners who successfully complete the examiners workshops are to be issued a certificate of proficiency making them eligible as occupational competency performance test examiners in their respective area of occupational expertise.

After completing the test developers workshop, persons who work on test development are to receive additional honorariums and expenses for work performed. The honorarium for test development should be approximately:

$100 for each performance test developed

$100 for each written test developed

$50 for each candidate - pre-test developed

$25 for each checklist of candidates experiences developed

Persons completing the performance test examiners workshop should receive a $50 honorarium for each performance test candidate examined. Note: up to two candidates may be assessed at the same time for this one fee when applicable.

The test center should take every step in assuring test development and test examiner workshops are carried out on a successful and ongoing basis. A master list of test developers and test examiners should be kept on file and updated according to name, occupational area and current school and/or home address and phone number (see Appendix G, Example 2). An example of a cover letter that can be used or refined for notification or verification of persons attending test development or test examiner workshops is shown in Appendix G, Examples 3 and 4. Sufficient funding should be set aside for test development and test examiner workshops in the occupational competency testing center budget or proposal funding.

Procedure 8 Procedures for Maintenance and Improvement of Occupational Competency Assessment

No center or program for occupational competency assessment would be complete without standard procedures and forms for maintenance and improvement of occupational competency examinations.

Recommended forms and their uses by the statewide program for occupational competency assessment are described below:

1. Master list of approved vocational and technical competency center. This form also includes information and a checklist on the U.S.O.E. code, certification title, type of exam (NOCTI or State), and other relative information according to each occupational competency examination title (see Appendix H, Example 1).
2. An occupational competency evaluation, Program Examination Maintenance form which is included in each occupational competency trade test examination folder of the number one master file. This form is used to record any changes, or revisions to the master examination file of an occupational competency examination and to list the dates the examination was actually administered (see Appendix H, Example 2).
3. An Inventory Control form which is used by the state competency center for recording information on all competency assessment materials sent to NOCTI or other occupational competency assessment centers according to examination title (see Appendix H, Example 3).
4. An occupational competency examinations checklist for development of written and performance examination instruments. This will aid in determining progress and completion of the various sections and materials needed in developing or revising a master occupational competency examination for a specific occupational area (see Appendix H, Example 4).

5. A frequency of occupational competency examinations administered checklist used in tabulating the total candidates assessed by types of examinations (competency examination, licensure, or credential review), form of examination (NOCTI or State), and failure ratio by occupational examination titles in a specific testing cycle or year, (see Appendix H, Example 5).
6. A Master Cost Analysis checklist which is used for determining the production, assessment, and administrative cost of each occupational competency examination administered by candidates name (see Appendix H, Example 6).

The forms described will be helpful in keeping an efficient and effective occupational competency program operating at its maximum capacity. However, no amount or type of forms are of benefit unless the occupational competency assessment center is staffed and operated by trained personnel who are dedicated to the advancement and improvement of valid and reliable occupational competency assessment instruments. Every effort should be made to train and retain the necessary competent personnel required for successful completion of the duties and objectives of a centralized statewide program for occupational competency assessment.

Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Need for the Study

With society growing more complex, occupations more specialized, continuing growth of the labor force and increasing demands for training through vocational technical education programs, the need for occupationally competent tradespersons and technicians is becoming critical. Consequently, there has been a growing concern over the need to accurately evaluate the occupational competency of vocational-technical instructors.

Statement of the Problem

The need for a valid and reliable method of assessing the occupational competency of vocational technical instructors on a national, statewide, and local level is a serious issue with which the social and educational community is growing increasingly concerned.

The current system which is used to assess occupational competency of vocational-technical personnel is only beginning to take affect on the national scale, with little, if any, important or significant developments in state or local occupational competency assessment. The problem then is not the need for or the importance of occupational competency assessment, but how to effectively develop, administer, and coordinate a valid and reliable occupational competency assessment program at the national, state and local levels.

Purpose of the Study

The purpose of the study was to review the current methods and programs of occupational competency assessment and to identify ways of increasing the effectiveness and use of occupational competency assessment thru the development of statewide centralized programs for occupational competency assessment.

Review of the Literature

The review of the literature and current information revealed two important issues. One issue was to promote the use and development of occupational competency examinations for vocational-technical instructors on a national state, and local level, and the second issue was the establishment of statewide centers that could coordinate and administer programs of occupational competency assessment between and at the national and local levels. The key historical, economic and social aspects relating to occupational competency assessment development and administration were reviewed to acquaint the reader with the unique qualities and problems associated with occupational competency assessment. Primary among these was the relationship between the development of written and performance testing, the establishment of a National Occupational Competency Assessment Program, and the review of alternative methods used in establishing valid indicators of occupational competency assessment.

The need for establishing a centralized competency assessment program in each state and the use of written and performance based occupational competency examinations appeared to be the most feasible and viable methods of improving occupational competency assessment.

Objectives

The purpose of this study was to provide the basic information and representative examples necessary for the establishment of administrative procedures required in conducting a statewide program of occupational competency assessment.

In order to meet the objectives the following recommended procedures for the development and implementation of an occupational competency assessment program were developed:

1. Funding and proposal guidelines.
2. Development of a centralized office for occupational competency assessment.
3. Procedures for evaluation of the candidate.
4. Coordination and use of National Occupational Competency Testing Institute examinations.
5. Development of written occupational competency assessments.
6. Development of performance occupational competency assessments.
7. Test development and test examiners workshops.
8. Maintenance and improvement of occupational competency assessment.

Conclusions

It appears that the need and importance of developing and implementing a valid and reliable method of assessing vocational-technical instructors is one of the most crucial issues facing vocational education, general education, and society today. If local, state, and national programs cannot be developed, improved, and coordinated in assuring the

occupational competency of vocational-technical instructors then the training of competent men and women for todays job market and the future of the education and our society as a whole is in danger.

The advantages of developing, funding, operating and administering valid programs of occupational competency assessment are minimal compared to the inadequate, and inefficient use of millions of dollars and countless hours of ineffective student preparation which occurs through incompetent vocational-technical instructors at the secondary and post-secondary levels.

A real effort to improve the occupational competency of vocational-technical instructors will raise the level of education provided, and raise the professional recognition of vocational teachers. Thus, contributing to the further improvement of vocational education and society as a whole.

Recommendations

Based on the findings of the study the following recommendations are made:

1. That a statewide center for administration of occupational competency assessment be established in all states.
2. That local and state occupational competency assessment programs coordinate their efforts with the National Occupational Competency Testing Institute.
3. That a certificate of occupational competency be granted by each state after a candidate successfully completes the occupational competency examination in his/her occupational trade area.

4. That certification of occupational competency according to occupational trade area be required for full-time vocational-technical instructors at the state and national level in all secondary and post-secondary education.
5. That occupational competency examinations be made available and encouraged for use in private industry.
6. That reciprocal agreements be established between all states in accepting successful completion of occupational competency examinations as proof of occupational competency according to standardized occupational areas.
7. That occupational trade area titles and code numbers used in occupational competency assessment be standardized, defined and recognized among all state centers according to NOCTI supervision.
8. That state and federal recognition and funding of approved occupational competency assessment programs be encouraged and established.
9. That vocational teachers be encouraged to engage in studies in higher education through the granting of extensive collegiate credits for persons successfully completing the trade competency examination.
10. That a combined performance based and written form of occupational competency assessment be developed and used in all areas of vocational-technical education whenever possible.
11. That centers and programs for occupational competency assessment be funded and staffed with full-time personnel.

12. That vocational-technical teacher training institutions encourage the successful completion of occupational competency assessment as a part of the students educational development and program.
13. That more workshops and educational programs are conducted in expanding the importance and use of occupational competency assessment.
14. That research and test development be expanded in providing improved methods and instruments for assessing occupational competency.

REFERENCES

Boyd, Jr., J. L.; Shimberg, B. Handbook of Performance Testing. Educational Testing Service, Princeton, New Jersey, 1971, 1-5.

B.V.E.P.D.E.-77. "Pennsylvania Policy Manual for Administration of The Occupational Competency Assessment Program," Bureau of Vocational Education Pennsylvania Department of Education, May, 1977, 1-18.

Comer, J. C. Trade Competency Testing Via Specimen Inspection. Journal of Industrial Teacher Education, 1971, 9, 50.

Educational Testing Service (E.T.S.). "Assessing Occupational Competency," Pamphlet: Center for Occupational and Professional Assessment Educational Testing Service, 1-2.

Funk, G. "Management Improvement Activity," Pennsylvania Occupational Competency Exam Program, 1977, 1-3.

Impellitteri, J. T. Constructing Valid Occupational Competency Examination, A Paper Prepared for the Second Seminar on Feasibility of Providing Trade Competency Examinations on a National Level, 1966, 5-6.

Karwaski, P. A.; Scofield, N. M.; Welch, F. G. "Final Report: Evaluation of New and Revised Occupational Competency Examinations," Occupational Competency Evaluation Monograph Number 1, The Pennsylvania State University Department of Vocational Education, December 75, Vol. 13, Number 10, Page xi.

Kraft, H. "The Occupational Competency Evaluation Program," Division of Occupational and Vocational Studies, The Pennsylvania State University, 1977, 1-3.

N.O.C.T.I. "Bulletin of Information for Candidates," National Occupational Competency Testing Institute, 1977-78, 1-3.

Panitz, A. and Olivo, C. T. "Handbook for Developing and Administering Occupational Competency Tests," National Occupational Competency Testing Institute, 1971, 3, 1, 6-9, 12.

Panitz, A. "National Occupational Competency Exams for Future Teachers," American Vocational Journal, 1975, 50, 72-77.

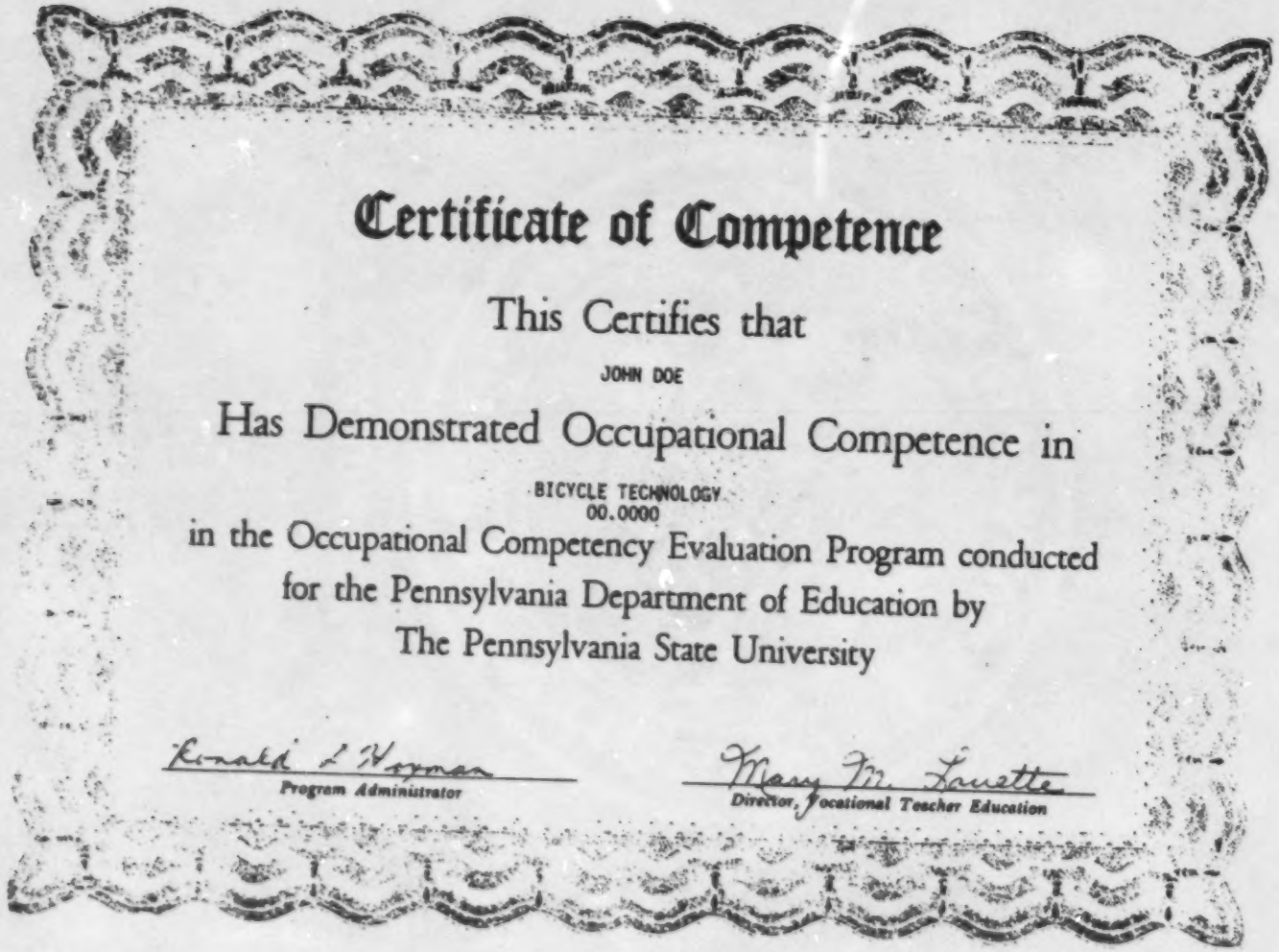
Pennsylvania Department of Education (P.D.E.). "Guidelines for Project Funding, 1977-78, Vocational Education Personnel Development," Pennsylvania Department of Education, 1977-78, 1-11.

Texas A&M University. "Designing Objective Essay and Performance Test," Teachers Guide, Vocational Industrial Education Texas A&M University, 1970, Page 78-80.

Williams, W. A. "Writing Multiple Choice Test Items and Test," A Handbook for Trade and Industrial Education Teachers. Department of Vocational Education, The Pennsylvania State University, 1970, p. 1-30.

APPENDIX A

Example 1 Occupational Competency Certificate
Example 2 Occupational Competency Assessment Fee Schedule
Example 3 Resume of Program Cost for Candidate Assessment
Example 4 Funding Proposal Abstract
Example 5 Funding Proposal Outline



Certificate of Competence

This Certifies that

JOHN DOE

Has Demonstrated Occupational Competence in

BICYCLE TECHNOLOGY
00.0000

in the Occupational Competency Evaluation Program conducted
for the Pennsylvania Department of Education by
The Pennsylvania State University

Ronald L Hoffman
Program Administrator

Mary M. Lauette
Director, Vocational Teacher Education

Example 1

Example 2

OCCUPATIONAL COMPETENCY ASSESSMENT FEE SCHEDULE
(Effective July 1, 1978, until revision approved by the State Director of Vocational Education)

$200 is paid to the Occupational Competency Assessment Center by each test or retest administered whether a state developed test or a NOCTI test or examination by committee where honoraria are involved for occupational specialists.

$ 50 additional late fee is charged is a case where a candidate misses the announced closing date for admission, but by special handling can make a bi-seasonal testing date.

$400 is charged for an off season isolated test or assembled committee evaluation including occupational specialists and involving honoraria.

$ 50 total is charged for assessment by credential evaluation by university staff only and not involving honoraria and is limited to work experience since approved state or federal occupational licensure.

$100 total is charged for supplying written portion of state developed test only and for scoring, analyzing and reporting to an authorized testing agent out-of-state, providing that the title requested is not also a NOCTI title.

Example 3

RESUME

OCCUPATIONAL COMPETENCY ASSESSMENT PROGRAM FOR PENNSYLVANIA
FOR PERIOD JULY 1, 1976 THROUGH JUNE 30, 1977

	Total Candidates Assessed	Total Tests Administered	Failures	NOCTI	Licensure	Oral Evaluation
The Pennsylvania State University	100	84	9	30	15	1
Temple University	190	141	43	78	21	28
University of Pittsburgh	125	80	25	30	41	4
	415	305	77	138	77	33

Program failure rate

$\frac{77}{415}$ = 18.6%

Program failure rate by institution

Penn State	Temple	Pitt
$\frac{9}{100}$	$\frac{43}{190}$	$\frac{25}{125}$
9.%	22.6%	20.%

Tests administered failure rate

$\frac{77}{305}$ = 25.2%

Tests administered failure rate by University

Penn State	Temple	Pitt
$\frac{9}{84}$	$\frac{43}{141}$	$\frac{25}{80}$
10.7%	30.7%	31.3%

NOCTI - % of total tests administered

$\frac{138}{305}$ = 45.2%

Program cost per individual assessment

*a. $\frac{\$83,019}{415}$ = $ 200.05

b. $\frac{\$109,694}{415}$ = $ 264.32

Program cost per total assessment by institution

Penn State	Temple	Pitt
$\frac{\$29,184}{100}$ =	$\frac{\$31,135}{190}$ =	$\frac{\$22,700}{125}$ =
$291.84	$163.87	$181.60

* a. Coordinator cost only.

b. Coordinator and project cost - less candidate fees ($41,925).

Example 3 (continued)

OCCUPATIONAL COMPETENCY ASSESSMENT PROGRAM FOR PENNSYLVANIA FOR PERIOD JULY 1, 1976 THROUGH JUNE 30, 1977

Average cost per test administered

*a. $\frac{\$83,019}{305}$ = $ 272.19

b. $\frac{\$109,694}{305}$ = $359.65

Average cost per successful testing

*a. $\frac{\$83,019}{228}$ = $ 364.12

b. $\frac{\$109,694}{228}$ = $ 481.11

Cost per successful assessment by institution (test administered/licensure/ oral evaluation)

Penn State	Temple	Pitt
$\frac{\$29,184}{84}$ =	$\frac{\$31,135}{141}$ =	$\frac{\$22,700}{80}$ =
$347.43	$220.82	$283.75

Cost per successful testing by institution

Penn State	Temple	Pitt
$\frac{\$29,184}{75}$ =	$\frac{\$31,135}{98}$ =	$\frac{\$22,700}{55}$ =
$389.12	$314.49	$412.72

* a. Coordinator cost only.

b. Coordinator and project costs - less candidate fees ($419.25).

Example 4

Funding Proposal Abstract

The first step in writing a proposal for funding any part of an occupational competency assessment program is to prepare and submit a one-page abstract in the following format:

A. Title of the Project

B. Submitted By _____
Name

_____
College or Agency

C. Total Funds Requested: _____

D. Proposed Beginning and Ending Dates:

E. A Three-Part Summary Including:

1. A Statement of the Problem
2. The Objectives of the Project
3. An Explanation of Procedures or Description of What is to be Done, (P.D.E., 1977).

The intent of this abstract is to establish the relationship of the future proposal with State priorities so that adjustments and revisions can be made accordingly.

Example 4 (continued)

Recommended budget guidelines in writing a proposal for funding any part of an occupational competency assessment program are:

A. Salaries:

Including the maximum individual salary amounts for program director, secretaries, and assistant personnel.

B. Employee Benefits:

The employers share of employee benefits may be included for each person for whom a salary is claimed. Normally, employee benefits will be those mandated for the governing state or institutions personnel. When employee benefits are in excess of 25 percent of total salaries, a cost breakdown must be provided.

C. Honoraria:

Honoraria for resource persons to improve occupational competency assessment functions is a vital and reimbursable expenditure. Prevailing state competency center honoraria and estimated travel cost of the resource persons should be included.

D. Travel:

Travel cost incurred will be reimbursed according to the maximum cost and basis of the governing state or educational agency. Suggested maximum rates for reimbursement of travel expenses are:

Mileage rate: 15¢ per day

Subsistence: $13.00 per day

Lodging: $20.00 per one nights lodging

Example 4 (continued)

E. Office Supplies/Communications:

Expenditures for appropriate office supplies, and necessary communications are reimbursable.

F. Instructional Salaries:

Instructional salaries and supplies essential to occupational competency assessment test development and examinations are a reimbursable expenditure.

G. Instructional Equipment:

1. Equipment eligible for funding must be intended for occupational competency program use only. List the quantity and type of equipment according to specified need, exclusive of brand name, and estimate the cost.
2. Equipment rental will be permitted where it is economically more feasible than purchasing.
3. Approved equipment for purchase or rental, may be funded from project funds at 100 percent of cost.

H. Other:

Explain the nature of the estimated expense, and illustrate how the estimate was derived.

Example 5

RECOMMENDED GUIDELINES FOR PROPOSAL PREPARATION

A. The Proposal

1. Cover Page

a. Concise, descriptive title

b. Applicant's name, address, and phone number

c. Institution and/or agency's name, address and phone number

d. Beginning and ending dates of the project using first of month and end of the month dates

e. Estimated budget

f. Project initiator's name, title, and phone number

g. Abstract describing expected outcomes

*Indirect costs are costs of a general nature which are not readily identifiable with specific activities. They are incurred for a common or joint purpose benefiting more than one activity. Examples of services for which indirect costs may be attributed are accounting, payroll, budgeting and purchasing services.

2. Body

a. Need

Give a brief statement of the people, program and/or industry need. Explain its importance and relationship to vocational education as related to the specific area.

b. Objectives

State the objectives to be achieved. Objectives should be clear, precise, quantitative and capable of being attained by the proposed procedures.

c. Procedure

Describe the uniqueness of this proposal.

1) Who--Describe the people to be served. Identify the specific number of students participating in the project.

2) When--Describe when the program will operate.

Example 5 (continued)

3) How--Describe in chronological order how the program will operate to meet the stated objectives.

d. Personnel

Include the names of all individuals required to operate the program. Prepare a chart indicating responsibility and special services which these persons will provide. Where the position is vacant, indicate same. Include a statement indicating the adequacy and competency of the staff.

e. Facilities

Indicate the facilities which will be used to carry out this program.

f. Evaluation and Reports

Indicate how the project will be evaluated. The evaluation procedures should relate to the objectives of the project.

A final report (five copies) shall be submitted at the conclusion of the project.

g. Dissemination

Describe how the results of the program may be communicated to other educational institutions, labor groups, chambers of commerce, etc.

h. Financial Support

Describe how the proposed program may or may not operate when federal funds are no longer available.

i. Budget

(See special guidelines.)

APPENDIX B

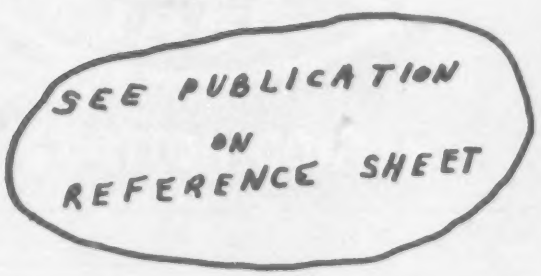
Example 1 Policy Manual for Administration of The Occupational Competency Assessment Program

Example 2 Approved Vocational Course and Certification Titles

Example 1

PENNSYLVANIA POLICY MANUAL
FOR
ADMINISTRATION OF THE OCCUPATIONAL COMPETENCY
ASSESSMENT PROGRAM
FOR
VOCATIONAL INSTRUCTIONAL CERTIFICATION CANDIDATES
AND
VOCATIONAL INTERN CANDIDATES

BUREAU OF VOCATIONAL EDUCATION
PENNSYLVANIA DEPARTMENT OF EDUCATION



Example 1 (continued)

CONTENTS

		Page
	Determination of Occupational Competency of Vocational Instructor Candidates	1
I.	Basis in Tradition	1
II.	Basis in Mandate	2
	A. All Pennsylvania Teachers Must Be Certificated	2
	B. The Vocational Instructional Certificate	2
	C. The Vocational Intern Certificate	2
	D. Evaluation of Experience and Educational Backgrounds	3
III.	Basis in Current Practice	3
	A. Funding and Vocational Teacher Education Program Approval	3
	B. Supplemental or Project Funding	4
IV.	Standardized Practice in Administering Occupational Competency Assessment	4
	A. Evolution of Assessment Practices	4
	B. Designation of Institutional Occupational Assessment Coordinator	5
	C. Use of Standardized National Tests (NOCTI)	5
	D. Instruction in Test Administration	6
	E. Test Administration Cost Payments	7
	F. Duties of Institution Test Coordinator (OCEC)	7
	1. Standard Candidate Information Brochure	7
	2. Prospect and Candidate Counseling	8
	3. Testing Season Publicity	8
	4. Candidate Formal Assessment Enrollment	9
	5. Assessment Facilities and Proctoring Personnel	9
	6. Candidate Assessment Admission Notification	10
	7. Candidate Withdrawal From Test	10
	8. Assessment Results and Reporting	11
	9. Re-Testing of Candidates	12
	10. Appeals To Assessment Results	13
	11. Test Site Regional Transfers	13
	12. Ready Reserve NOCTI Tests	14
V.	Standardized Practice in Test Development	14
	A. Need For Development (New and Revised)	14
	B. Format For Developing Tests	15
	1. Course Description	15
	2. Categories of the Test	15
	3. Occupational Analysis Is Proportioned	15
	4. Test Items Directly Proportioned	15
	5. Four Detractor Multiple Choice Tests	15
	6. Instructions To Examiner (Proctor)	15
	7. Instructions to Examinee (Candidate)	15
	8. Instructions for Withdrawal	16

Example 1 (continued)

		Page
	9. Evaluation Instructions for Proctor	16
	10. Examinee and Proctor Suggestions	16
	11. Camera-ready Masters	16
C.	Membership of Development Committee	16
D.	Training and Operation of Development Committee	16
E.	Answer Key Provided	17
F.	Validation of Draft Test	17
G.	Acceptable Reliability	18
H.	Revision of Test Data	18
I.	Test Master Copy Depositories	18
	Occupational Competency Assessment Fee Schedule	Appendix "A"
	NOCTI Tests Used and Available in Pennsylvania	Appendix "B"
	Process Sheet for Occupational Competency Evaluation	Appendix "C"
	Application for Occupational Competency Evaluation	Appendix "D"-"D-1"
	Verification of Work Experience	Appendix "E"-"E-1"
	NOCTI Directions and Registration Form	Appendix "F"-"F-1"
	Foreword	iii
	Contributors	iv
	Table of Contents	v, vi

Example 2

APPROVED

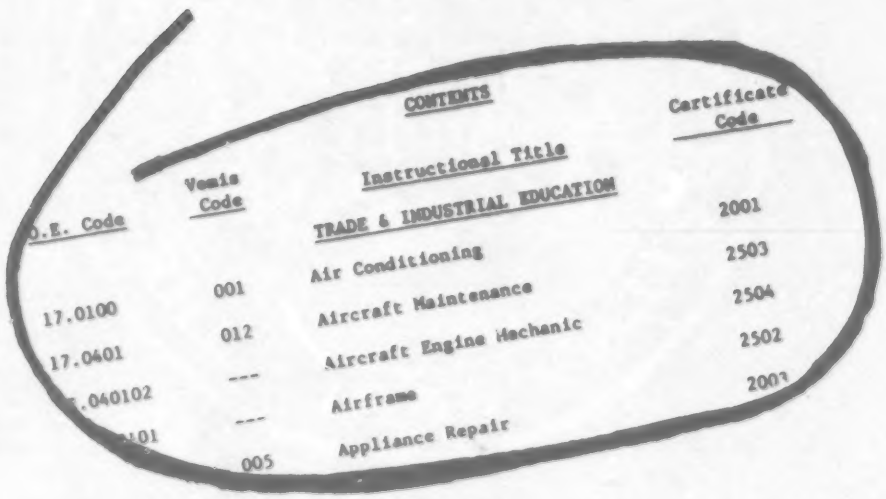
VOCATIONAL COURSE DESCRIPTIONS

FOR

PENNSYLVANIA SECONDARY SCHOOLS

INCLUDING

USOE CODE - CERTIFICATE TITLE & NUMBER -
CERTIFICATION METHOD



CONTENTS

O.E. Code	Vemia Code	Instructional Title	Certificate Code
		TRADE & INDUSTRIAL EDUCATION	
	001	Air Conditioning	2001
17.0100	012	Aircraft Maintenance	2503
17.0401	---	Aircraft Engine Mechanic	2504
.040102	---	Airframe	2502
:101	005	Appliance Repair	2003

PENNSYLVANIA DEPARTMENT OF EDUCATION
FEBRUARY 1977

APPENDIX C

Example 1 Occupational Competency Evaluation Program
Example 2 Check List for Candidates Experience
Example 3 Pre-Assessment Test Examples
Example 4 Scope of the Exam Description
Example 5 Scope of the Exam Written and Performance Test Percentage Breakdown
Example 6 Application for Occupational Competency Examination
Example 7 Verification of Work Experience Form for Occupational Competency Evaluation

B. The fee for the regularly scheduled Spring and Fall testing program is $150. Should the applicant request an individual or emergency evaluation to be conducted at a time other than the scheduled Spring or Fall program, the assessed fee shall be $300. In cases involving a licensure occupation, and a valid license serves in lieu of the examination, the assessed fee for the evaluation of credentials shall be $40.

Checks are to be made payable to The Pennsylvania State University.

V. Credentials

Education must be verified by a photo-copy of a diploma or an official transcript. Official transcript of all school work must be mailed directly to the Division of Occupational and Vocational Studies, 110 Rackley Building, University Park, PA 16802, by the issuing institution. Where the G.E.D. examination applies, a photo-copy of the G.E.D. certificate is acceptable.

Employment Experiance must be verified by former employers as well as the candidate's present employer. Form DEBE–1619, obtained through the Division of Occupational and Vocational Studies, is required of each employer. The form requests dates of employment, hours worked per week, duties, responsibilities, reason for leaving, the degree of satisfaction the candidate rendered as an employee and should be signed by an official of the firm together with his or her title.

If the applicant has owned or operated his or her own business, six letters of verification should be furnished. These letters should be from reliable sources such as customers or suppliers and should indicate the extent of the business and the applicant's occupational competence with dates when the service was rendered. In addition, the applicant should submit with the application a a brief notorized statement about the business, including dates and the nature of the work performed.

VI. Examination/Evaluation

A. *Schedule*–Examinations are scheduled twice yearly – in late April and again in late October. Applications and all supporting data are required six weeks prior to the examination date. Candidates will be notified, if approved, of the time and place of the examination.

The written examination involving the theoretical aspects or knowledge of the trade requires approximately three hours to complete and consists of multiple-choice questions. This portion of the examination is administered at Penn State.

The performance examination consists of a series of skill assignments designed as an opportunity for the applicant to exhibit skill and craftsmanship of the trade. This portion of the examination requires from four to five hours and is administered in a shop/laboratory of a vocational-technical school by a qualified examiner.

Examination Results – Candidates will be notified of the examination results aoproximately three weeks following the examination date. Notification of the examination results to any person other than the candidate is prohibited.

VII. Re-examination

A candidate failing to satisfactorily complete the Occupational Competency Examination and who is recommended for a re-examination may apply for a re-examination. However, the candidate must:

1. Obtain an additional one year (2000 hours) of wage earning work experiance
2. Submit a request for a re-examination together with verification of the additional one year of work experience
3. Submit an additional fee for the re-examination

The Pennsylvania State University

Division of Occupational and Vocational Studies

University Park, Pennsylvania 16802

THE OCCUPATIONAL COMPETENCY EVALUATION PROGRAM

Example 1

Inquiries, correspondance and applications should be directed to:

Department of Vocational Education
110 Rackley Building
University Park, PA 16802
814/865/6361

I. Authorization

The Pennsylvania Department of Education, through the Bureau of Vocational Education, has authorized Penn State University to administer the Occupational Competency Evaluation Program (OCEP) for persons who desire to teach shop/laboratory subjects on a vocational basis. A key element in the OCEP is the Occupational Competency Examination or Evaluation, which is one of the legal requirements for issuing a teaching certificate in Pennsylvania. Examinations are in two parts:

A. A written examination consisting of approximately 200 multiple-choice items and requiring approximately three hours to complete.

B. A performance examination administered in a school shop consisting of work assignments that require four to five hours to complete.

II. Eligibility Requirements

To be eligible for the evaluation program the candidate must satisfy the following requirements:

A. *General education*—Must be a graduate of a secondary school or possess equivalent education credentials.

B. *Employment experience*—The candidate ". . . shall have *sufficient* employment experience beyond the learning period to establish competency in the occupation to be taught."

C. Must be enrolled in Vocational Teacher Education courses at Penn State University.

D. Must submit a complete personnel file of required credentials by the announced deadline.

III. Employment Experience Guidelines

A. The following *may* be used to meet the employment experience requirement:

1. Wage earning experience in the occupation to be taught
2. Comprehensive experience to include a major coverage of the skills of the occupation—*not* a narrow sampling of a few skills of a specialized nature
3. Must have been completed within a ten (10) year period immediately prior to successful completion of the occupational competency examination

B. The following *may* be accepted toward the learning period requirement.

1. Wage earning experience in the occupation to be taught
2. Wage earning experience as an apprentice and/or learner in the occupation to be taught
3. Wage earning experience in an occupation *directly related* to the occupation to be taught
4. Educational experience in the occupation to be taught, e.g., as a student in a vocational school, technical institute or college
5. Educational experience in a cooperative vocational education program, in the occupational field to be taught
6. Educational experience as a student in a vocational teacher education program which includes specialized or technical courses *directly related* to the occupation to be taught
7. Educational experience as a student in an associate degree program, in the occupational field to be taught
8. Graduation from an approved four (4) year college curriculum when the major field of study is *directly related* to the occupational field to be taught
9. Military experience *directly related* to the occupation to be taught
10. State professional licensure or selected national certification in the occupation to be taught

C. The following *may* be considered as "other guidelines":

1. Part-time work experience will be evaluated on the basis of two thousand (2000) clock-hours as equivalent to one (1) calendar year
2. For occupations requiring a state professional license or selected national certification, such license or certification when issued by an accredited state or national association will be accepted in lieu of the competency examination, but *not* in lieu of the Occupational Competency Program, which includes evaluation of wage earning experience beyond the learning period, the validating of licenses, and high school graduation or equivalent
3. Work experience used in verifying occupational experience in one occupation may *not* be used to verify occupational experience in a second occupation.

D. Occupational experience for related groups of occupational skills (cluster concept) shall require occupational experiences in each major area of the occupational group

E. Teaching experience or supervisory experience cannot be counted toward the work experience requirement.

IV. Application Forms, Fees

A. Application forms can be obtained by contacting the Division of Occupational and Vocational Studies, 110 Rackley Building, University Park, PA 16802

1. All parts of the application must be completed
2. Use additional sheets for detailed information if necessary
3. The application and all attachments must be notorized

Example 2

AUDIO-VISUAL COMMUNICATIONS TECHNOLOGY

Check List for Candidate Experiences

General Information & Theory

- ☐ Principles & concepts of communication types
- ☐ Methods & use of audio-visual aids
- ☐ Materials fabrication
- ☐ Instructional theory
- ☐ Multi-media concepts

Design and Construction of Visuals

- ☐ Layout
- ☐ Design
- ☐ Use of color
- ☐ Fabrication

Transparencies

- ☐ Design
- ☐ Layout
- ☐ Color application
- ☐ Graphics
- ☐ Processes
- ☐ Materials

Photography

- ☐ Camera operation
- ☐ Lighting
- ☐ Framing
- ☐ Details of film types
- ☐ Film processing
- ☐ Diagnosing problems
- ☐ Projection

Motion Picture

- ☐ Film handling
- ☐ Set-up & operate various equipment
- ☐ Correcting typical difficulties

Tape Recorder

- ☐ Threading
- ☐ Recording
- ☐ Editing
- ☐ Operate equipment
- ☐ Correct Malfunction

Video

- ☐ Production techniques
- ☐ Script writing
- ☐ Equipment operation

1977

Example 3

OFFSET PRINTING

Pre-Assessment

Best Answer:

Directions: Each of the questions or incomplete statements listed below is followed by four possible answers. Read each question carefully and completely before you attempt to answer it. Choose the answer that you believe best answers the question or completes the statement. Completely darken the circle under the letter of your choice on the answer sheet. If you make a mistake be sure to erase clean.

---

1. Corrections in the flat are best made by

   a. platemaker.
   b. cameraman.
   c. stripper.
   d. pressman.

2. When a photo is marked indicating less than the full photo to be used, the marks indicate

   a. register.
   b. imposition guides.
   c. proportion.
   d. cropping.

3. The greasy image on a lithographic plate is receptive to

   a. water.
   b. ink.
   c. gum.
   d. etch.

Example 4

APPROVED INSTRUCTIONAL TITLES in
VOCATIONAL EDUCATION
DESCRIPTION and CODE

GRAPHIC ARTS

17.1900 GRAPHIC ARTS

Organized, specialized learning experiences which include theory, laboratory, and shopwork as they relate to all phases of hot and cold typesetting, layout, composition, presswork, and binding, including flexography, lithography, photoengraving, and other graphic arts related to the printing industry. Emphasis is on typographical layouts and design, hand and machine typesetting, camera and plate work, imposition, typecasting, offset and platen press makeup and operation, papercutting, ink and color preparation binding, and production by silk screen process.

CERTIFICATE REQUIRED	CERTIFICATION METHOD	OCCUPATIONAL COMPETENCY AREA	OCCUPATIONAL COMPETENCY EVALUATION
Vocational Instructional 2600	Vocational - Instructional (non-degree program)	Graphic Arts 2057	NOCTI - Printing

Previously issued teaching certificate - still valid - but no longer issued
Graphic Arts 2057

Example 5

Graphic Arts
USOE No. 17.1900
Pennsylvania Certificate No. 2057

Written Test

Three hours

12% Design

Elements of good design; preparation of copy, selection of method of composition, imposition, layouts, page imposition, work & turn.

23% Composition

Advantages & disadvantage of hot & cold type of composition; familiarity with operation of varityper, photo-typositor, headliner, foto setter, etc.

15% Photo-Preparatory

Camera determination of line & halftone copy for various types of jobs; different types of films, chemicals & their use.

15% Image-Carriers

Knowledge of common stripping practice; use of tools & equipment of the trade (plate-making--presensitized offset plates: use, advantages & disadvantages), step & repeat plate-making; other types of offset plates & masters.

24% Image Transfer

Make ready practices, including positioning, preparing the packing, mixing inks & additives & preparation of chemicals; principles of operation of letterpress and lithography problems involving all kinds of forms, maintenance of rollers, use of drying & offset devices, scoring & offsetting.

11% Finishing

Familiarity with operations involving bindery work, folding, stitching, trimming, padding, punching; also types of bindings & other finishing operations.

Performance Test

Five hours

15% Design

Interpret copy & analyze instruction making thumbnail sketches & layouts: use of printers point system, type specimen books, rules & scales; select appropriate type faces, layout page imposition using a dummy.

25% Composition

Use of adhesives, rules & scales, pen & ink ruling, T-Square, triangle, paste-up preparation of copy for offset reproduction; make up that includes cuts, rules borders, crop marks, proofreading, treatment of corrections.

10% Finishing

Basic bindery operation: cut stock, fold, stitch, trim, pad, punch & operate other bindery equipment.

15% Photo-Preparatory

Use of films, chemicals & supplies; photographic techniques for contact (same copy, enlargement, reduction).

10% Image Carriers

Basic technique of stripping, use of tapes, T-square, triangles, scribes, knives, straight edges, line-up tables, line up golden rod for margins, centers, gripper margin, etc.

25% Image Transfer

Know offset and/or letterpresses: adjust feeder controls & press pressures, position image, control ink during press run, run press.

Example 6

HOME PHONE: _____

BUSINESS PHONE: _____

APPLICATION
FOR
OCCUPATIONAL COMPETENCY EVALUATION

NAME: _____ (LAST) _____ (FIRST) _____ (MIDDLE)

SOCIAL SECURITY NO.

ADDRESS:

BIRTH DATE _____

SEX M___ F___

INSTRUCTIONAL TITLE FOR WHICH EVALUATION IS REQUESTED

_____

HAVE YOU PREVIOUSLY BEEN EVALUATED FOR COMPETENCY?

YES _____ NO _____

IF YES, IN WHAT OCCUPATION _____

MAKE CHECK IN AMOUNT OF $_____
PAYABLE TO _____
AND RETURN WITH APPLICATION
TO Harry M. Kraft

110 Rackley Building
The Pennsylvania State University
University Park, PA 16802

IF YES: PASS _____ or FAIL _____

DATE _____

NAME OF UNIVERSITY _____

RECORD OF EDUCATION -- (Begin with high school graduation or GED).

EDUCATIONAL INSTITUTION (Name and Location)	MAJOR COURSE	ATTENDED FROM MO.	FROM YR.	TO MO.	TO YR.	TOTAL ATTENDANCE YEARS	MONTHS

APPLICANT'S SIGNATURE _____ DATE _____

FOR UNIVERSITY USE

APPLICANT APPROVED FOR EVALUATION BY TEST _____

APPLICANT APPROVED FOR EVALUATION BY COMMITTEE _____

APPLICANT NOT APPROVED FOR EVALUATION _____

DERE-273

(COMPLETE OTHER SIDE)

OCCUPATIONAL EXPERIENCE STATEMENT

EMPLOYER (COMPANY NAME AND LOCATION)	OCCUPATION	FULL TIME EXPERIENCE NATURE OF WORK (WHAT DID YOU DO?)	PERIOD OF EMPLOYMENT FROM		TO		TOTAL	
			MO.	YR.	MO.	YR.	YRS.	MO.

EMPLOYER (COMPANY NAME AND LOCATION)	OCCUPATION	PART TIME EXPERIENCE NATURE OF WORK (WHAT DID YOU DO?)	PERIOD OF EMPLOYMENT TOTAL WEEKS	AVERAGE HOURS PER WEEK

COMMONWEALTH OF PENNSYLVANIA

County of _____

Applicant personally appeared before me and being duly sworn according to law, deposes and says the foregoing statements are true and correct.

_____
Applicant Signature

_____
Date

Sworn and subscribed before me this _____ day of _____, 19__

_____

Example 6 (continued)

Example 7

VERIFICATION OF WORK EXPERIENCE
FOR
OCCUPATIONAL COMPETENCY EVALUATION

NAME	SOCIAL SECURITY NUMBER
ADDRESS	TYPE OF EMPLOYMENT WAS: ____ Fulltime ____ Part-Time
JOB CLASSIFICATION IN WHICH EMPLOYED	DATES OF EMPLOYMENT Started _____ Terminated _____

LEVEL OF WORK PERFORMED WAS: (Approximate number months or years in appropriate category)

Years	Months	
_____	_____	LEARNING LEVEL--Helper, trainee, apprentice, etc.
_____	_____	BEYOND LEARNING LEVEL--Journeyman, master, expert, senior position
_____	_____	SUPERVISORY LEVEL--Dept. head, foreman, section leader
_____	_____	OTHER

DESCRIBE DUTIES PERFORMED - Please be specific so that a clear evaluation can be made of the applicant's type and quality of occupational experiences.

EMPLOYER PLEASE RETURN TO:

Harry M. Kraft
1108 Rackley Bldg.
University Park,
PA 16802

INFORMATION PROVIDED BY:

SIGNATURE _____

TITLE _____

DATE: _____ Telephone: _____

REPRESENTATIVE FOR: _____

Example 7 (continued)

_____
Date

Dear _____:

The person named on the reverse side has applied for an evaluation of occupational experience and competency in _____ occupation. This evaluation is one of the requirements for issuance of a certificate to become a teacher of a vocational education subject in the public schools of Pennsylvania.

The applicant will appreciate your providing the university indicated on the reverse side with the information requested on this form for the time employed by your establishment.

This information is completely confidential. Your cooperation is appreciated.

Sincerely yours,

_____
Name

_____
Title

APPENDIX D

Example 1 NOCTI--Examination Order Form
Example 2 NOCTI--Order Form for NOCTI Materials
Example 3 NOCTI--Scope of the Exam Sample
Example 4 NOCTI--Directions for Completing Registration Form
Example 5 NOCTI--Registration Form

Example 1

NATIONAL OCCUPATIONAL COMPETENCY TESTING INSTITUTE

EXAMINATION ORDER FORM

PLEASE complete and return to the Institute Director at least two weeks prior to your Administration. Keep one copy for your records.

CENTER_____ TEST DATE_____

	Air Conditioning and Refrigeration
	Airframe and Power Plant
	Architectural Drafting
	Auto Body Repair
	Auto Mechanic
	Building Trades Maintenance
	Cabinet Making and Millwork
	Carpentry
	Civil Technology
	Computer Technology
	Cosmetology
	Diesel Engine Repair
	Electrical Installation
	Electronics Communications
	Industrial Electrician
	Industrial Electronics
	Machine Drafting
	Machine Trades
	Masonry
	Mechanical Technology
	Plumbing
	Printing
	Quantity Food Preparation
	Sheet Metal
	Small Engine Repair
	Welding
	TOTAL

ENCLOSURES: Number of Registration Forms_____ Amount of checks or money orders
(Originals ONLY)
$_____

Example 2

NATIONAL OCCUPATIONAL COMPETENCY TESTING INSTITUTE

ORDER FORM FOR NOCTI MATERIALS

Name _____

Institution _____

Address _____

_____ Zip Code _____

QUANTITY	MATERIALS
	Bulletin of Information for Candidates
	Registration Forms
	NOCTI Brochure (Extend Your Future)
	NOCTI News
	Handbook for Area Test Center Organization and Administration
	Cumulative National Norms
	NOCTI Constitution
	Order Form for NOCTI Test Materials
	Other

By _____

Date _____

Example 3

NATIONAL OCCUPATIONAL COMPETENCY TESTING INSTITUTE
SCOPE OF BUILDING TRADES MAINTENANCE EXAMINATION

Written Test -- 3 Hours

12% Heating, Air Conditioning and Refrigeration
Basic principles, controls, service requirements, troubleshooting, techniques, motors, small engines.

12% Carpentry
Tools, safety, standards, methods of fabrication, principles and practices cabinetry, related math.

10% Masonry
Trade tools, layout procedures and practices, safety, materials.

5% Custodial
Floor care, materials, processes.

12% Electrical
Principles, practices and procedures for installation of electrical power and equipment, (layout, cable, Bx) safety procedures, code provisions.

12% Painting and Wallpapering
Preparation, practices, materials, applications to different surfaces, care of tools and equipment, safety.

12% Plumbing
Operating principles and installation of commonly used materials and supplies. Installation of drains, plumbing fixtures tools, materials and equipment, service facilities.

3% Management Practices
Human understanding, dealing with people, supervisory practices, related math.

12% Sheet Metal
Materials, properties, working characteristics, tools and equipment, fabrication and assembling, knowledge of fluxes, applications.

10% Welding
Basic knowledge of oxy-acetylene and arc welding joint design, materials, tools and procedures safety practices.

Performance Test -- 5 Hours 35 Minutes

13% Masonry
Layout the bond, meeting dimensions stretcher, construction practices tools, efficiency. Uniformity of joints, plumb/level square, general appearance.

13% Welding
Set up of materials to be joined (brazing, soldering, arc welding) of equipment and torch, correct tip, flux and filler selection, current and rod selection. Use of test equipment and grinding.

10% Carpentry
Dry wall construction, layout, squareness accuracy, wallboard application and jointing.

10% Surface Coating
Preparation of surfaces, undercoating, application of finishes, use and care of equipment.

13% Electrical Installation
Wiring methods (Bx cable) lighting systems, switches, fixtures.

20% Plumbing
Installation of fixtures and accessories on a variety of materials (toilets, basins, etc.). Cut ferrous and non ferrous pipe, thread pipe, join and caulk. Testing of system under pressure.

5% Door Hardware
Hydraulic closures, speed, latching.

6% Glass Installation
Cut glass, remove and install glazing.

10% Custodial Services
Floor care, glass cleaning, interior dusting.

Example 4

DIRECTIONS FOR COMPLETING REGISTRATION FORM

Please use a pen to fill out the registration form and print everything except your signature. Follow the instructions below carefully since it is most important that your file be complete and accurate. Most items are self-evident. However, we would like to call your attention to the following:

ITEM 2. ADDRESS. Print the address at which mail will reach you for at least the next six months. All correspondence with you will be directed to the address you list.

5. SOCIAL SECURITY NUMBER. Enter it accurately since it will identify all your records concerning the NOCTI Examination.

6. SELF-DESCRIPTION. You can omit this if you wish. This item is included only to determine if there is any racial or ethnic bias in the tests. Should you choose to answer, check the box next to the group that best describes you. If you are not in any of these categories, check the line "Other" and fill in the name of your group.

8. EDUCATION. If you attended a private trade school or an evening program, describe it as best you can on the line "Other". Fill in the rest of the data requested.

9. EXPERIENCE. Round out your years of experience to the date of the test administration.

10. NOCTI EXAMINATION YOU PLAN TO TAKE. Print name of examination and enter code number, using the following:

CODE	EXAMINATION	CODE	EXAMINATION	CODE	EXAMINATION
06	Air Conditioning & Refrigeration	18	Civil Technology	09	Masonry
01	Air Frame & Powerplant	22	Cosmetology	23	Mechanical Technology
12	Architectural Drafting	04	Diesel Engine Repair	10	Plumbing
02	Auto Body Repair	08	Electrical Installation	19	Printing
03	Auto Mechanic	15	Electronics Communications	17	Quantity Food Preparation
24	Cabinet Making & Millwork	14	Industrial Electrician	11	Sheet Metal
07	Carpentry	16	Industrial Electronics	05	Small Engine Repair
		13	Machine Drafting	21	Welding
		20	Machine Trades		

11. TEST CENTER CODE. Enter correct Center code number, using the following:

CODE	TEST CENTER	CODE	TEST CENTER	CODE	TEST CENTER
001	ALABAMA, Bessemer	048	MISSOURI, Columbia	044	OREGON, Salem
002	ARKANSAS, Little Rock	046	NEBRASKA, Kearney	033	PENNSYLVANIA, Philadelphia
005	CALIFORNIA, Santa Monica	021	KENTUCKY, Frankfurt	035	SOUTH DAKOTA, Springfield
010	COLORADO, Fort Collins	022	MASSACHUSETTS, Boston	029	TEXAS, Austin
046	CONNECTICUT, New Britain	028	MICHIGAN, Big Rapids	045	UTAH, Logan
012	FLORIDA, Tampa	019	MONTANA, Havre	041	VERMONT, Montpelier
015	GEORGIA, Athens	020	NEW JERSEY, New Brunswick	031	VIRGINIA, Blacksburg
016	HAWAII, Honolulu	026	NEW YORK, New York City	042	WASHINGTON, Ellensburg
050	IDAHO, Pocatello	027	NORTH DAKOTA, Wahpeton	043	WEST VIRGINIA, Montgomery
049	ILLINOIS, Carbondale	030	OHIO, Columbus	047	WISCONSIN, Menomonie
018	IOWA, Ames	032	OKLAHOMA, Stillwater		

12. SIGNATURE. Write your name as you normally do. DO NOT PRINT.

Example 5

REGISTRATION #

TEST DATE_____

NOCTI REGISTRATION FORM

1. NAME _____ _____ ___ Telephone (Home)_____
   Last First M.I. (Business) _____

2. ADDRESS _____ _____ ____ _____
   Street City State Zip Code

3. SEX:
   ___Male
   ___Female

4. DATE OF BIRTH (numerals)
   ____ ____ 19___

5. SOCIAL SECURITY NUMBER
   ____ ____ _____

6. RACE OR ETHNIC GROUP (Optional)
   ___American Indian
   ___Black/Afro-American/Negro
   ___Caucasian/White
   ___Chicano/Mexican-American
   ___Oriental/Asian-American
   ___Puerto Rican
   ___Other_____

7. ARE YOU NOW TEACHING? ___Yes For ___ years LEVEL:
   ___No
   ___Sec.
   ___Post-Sec.
   ___Adult

8. EDUCATION:

	Number of years	Graduated Yes	Graduated No
High School	___	___	___
Vocational School	___	___	___
Vocational Program	___	___	___
Technical High School	___	___	___
Community College	___	___	___
Four-year College	___	___	___
Other _____	___	___	___

9. EXPERIENCE TOTAL ___ years
   Number of places worked ___
   Longest time ___ years
   Shortest time ___ years
   Supervisory Experience ___ years
   Number of workers supervised ___

10. NOCTI EXAMINATION YOU PLAN TO TAKE_____ TEST CODE #____

11. TEST CENTER CODE #_____

12. SIGNATURE_____ Date_____

Fee Paid by: Candidate ___
Institute or Agency___

Signed_____
Area Test Coordinator

PLEASE NOTE: RETURN the top sheet to the Institute Director; RETAIN second copy for your records; GIVE candidate "Ticket of Admission" from second sheet.

- - - -

APPENDIX E

Example 1 Validation Study Occupational Area Selection Form
Example 2 Validation Study Request Authorization Letter
Example 3 Cover Sheet for Occupational Competency Examinations
Example 4 Cover Page for Written Test
Example 5 Written Test--Instructions to Candidate
Example 6 Written Examination--Directions for Answering Questions
Example 7 Occupational Scan Sheet--General Answer Sheet
Example 8 Written Examinations--Diagnostic Overlays

Example 1

The State Center for

Occupational Competency Assessment

Name of School: _____

Director: _____ Telephone: _____

Address: _____ Region: _____

Select Trade Areas		No. of Students
# 18	Air Conditioning/Refrigeration	
# 19	Appliance Repair	
# 33	Electrical Occupations	

Example 2

THE PENNSYLVANIA STATE UNIVERSITY
COLLEGE OF EDUCATION
Division of Occupational and Vocational Studies
RACKLEY BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

January 25, 1978

Dear

The Pennsylvania State University is conducting validation studies for occupational competency testing for the Bureau of Vocational Education. This is the continuation of validation studies that have been conducted over the last several years.

In order to validate these tests (written portion only), we will sample 50 individuals - 40 senior students and 10 teachers and/or skilled tradespersons per test title. We are primarily interested in an item analysis of the test questions to determine which are good questions and which are bad. Complete confidentiality will be maintained. The person taking the test will be identified only as a teacher/tradesperson (T) or student (S).

An optional feature of this validation program could be feedback of strengths or areas that need additional involvement or training for the teacher. This is optional and would only be available to (and for) individual teachers at their request prior to testing. Otherwise, once testing is completed, individual results are unidentifiable.

There are five test titles to be validated, development having been completed within the last several months. We would like to include your teachers and students in this project for listed programs that are offered in your school. Teachers/tradespersons will be paid a $25.00 honorarium for taking the test. Test titles to be validated are:

Audio-Visual Communications
Building Trades Maintenance
Commercial Art
Scientific Data Processing
Welding

You may expect a phone call from me or one of our staff to answer questions you or your staff may have. We would also like to arrange a testing schedule if you could participate in this project.

Sincerely,

Example 3

OCCUPATIONAL COMPETENCY EXAMINATION

FOR

DEVELOPED BY

_____

FOR
BUREAU OF VOCATIONAL EDUCATION
PENNSYLVANIA DEPARTMENT OF EDUCATION
HARRISBURG, PA

Example 4

WRITTEN TEST

Example 5

Bureau of Vocational Education
PENNSYLVANIA DEPARTMENT OF EDUCATION
Harrisburg, Pennsylvania

OCCUPATIONAL COMPETENCY EXAMINATION

WRITTEN TEST

INSTRUCTIONS TO CANDIDATE

1. Read each question carefully and completely before you answer it.
2. Begin by answering those questions of which you are most certain of the answer. Leave the more difficult ones until the last.
3. If you are uncertain about the meaning of a question, explain your understanding of the question in writing and attach to answer sheet.
4. Place all answers in the space provided.
5. Show all your mathematical calculations on an extra piece of paper.
6. Sketches should be neat and all work clear and legible.
7. Be sure that you do not skip any pages. Read over the questions and your answers if you finish before time is called.
8. Remember this test is your opportunity to demonstrate how well informed you are about your trade or occupation.
9. If you decide to withdraw from this test, sign the following Withdrawal Statement. "I hereby indicate my voluntary withdrawal from this test."

   Signature _____ Date _____ Time _____

10. Your signature below indicates that you understand the instructions for taking this examination.

    Signature _____ Date _____ Time _____

Example 6

AIR CONDITIONING, HEATING AND REFRIGERATION
WRITTEN EXAMINATION

Best Answer:

Directions: Each of the questions or incomplete statements listed below is followed by four possible answers. Read each question carefully and completely before you attempt to answer it. Choose the answer that you believe best answers the question or completes the statement. Place an "X" in the circle under the letter of your choice on the answer sheet. If you make a mistake be sure to erase clean.

---

1. You are a technician assigned to the job of determining the cause of the frequent shut-down of a centrifugal pump. You determine that the pump is shut down by the safety overload in the motor starter and that the pump has been circulating an excessive quantity of cooling water as evidenced by a very low condensing pressure. What would you recommend to correct this problem?
   a. Move the pump to a higher elevation.
   b. Put heavier duty heaters in the starter.
   c. Install next larger horse power pump motor.
   d. Throttle pump discharge to increase discharge head.

2. The double duct system is considered a luxury system since temperature in each room is individually controlled. However, it is not the most economical system in relation to operating cost because of
   a. heat gain in double ducts.
   b. double air volume for double duct system.
   c. tempering cooling with heating.
   d. high static air pressure.

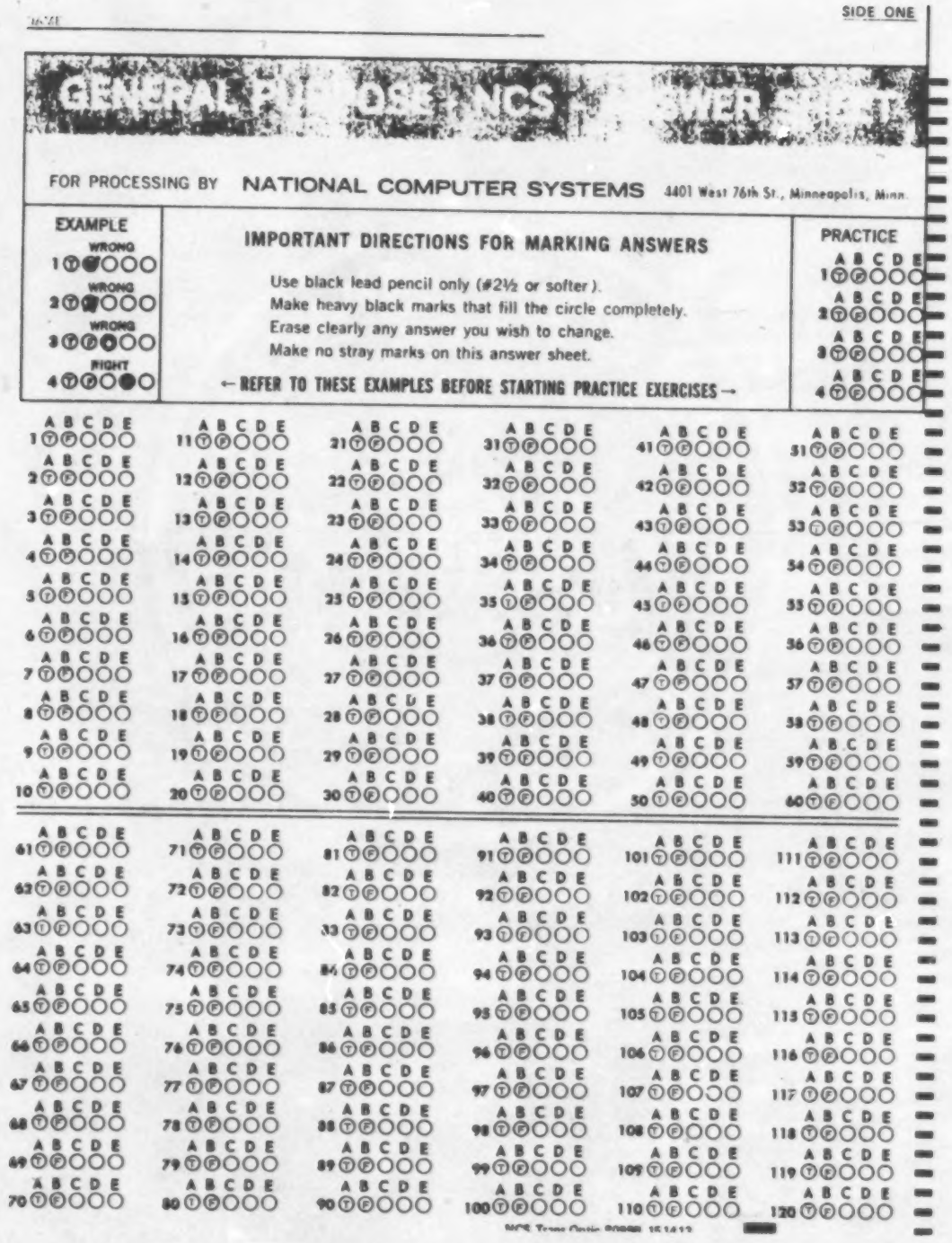
3. Psychrometry is the
   a. study of the effect of moisture in refrigerants.
   b. evaluation of sling psychrometer readings.
   c. study of the properties of air-vapor mixtures.
   d. relation of refrigerant pressure temperature and enthalpy.

4. An absorption machine is operating with a 40 degree evaporator temperature and a 108 degree condensing temperature. The corresponding pressures for the evaporator and condenser will be

	Evaporator PSIA	Condenser PSIA
a.	.25	1.25
b.	5.00	14.70
c.	1.00	5.00
d.	14.70	75.00

5. A frequently used superheat setting for a thermal expansion valve is
   a. 5 degrees.
   b. 10 degrees.
   c. 20 degrees.
   d. 30 degrees.

Example 7



SIDE ONE

GENERAL PURPOSE ANSWER SHEET

FOR PROCESSING BY NATIONAL COMPUTER SYSTEMS 4401 West 76th St., Minneapolis, Minn.

EXAMPLE

1 WRONG
2 WRONG
3 WRONG
4 RIGHT

IMPORTANT DIRECTIONS FOR MARKING ANSWERS

Use black lead pencil only (#2½ or softer).
Make heavy black marks that fill the circle completely.
Erase clearly any answer you wish to change.
Make no stray marks on this answer sheet.

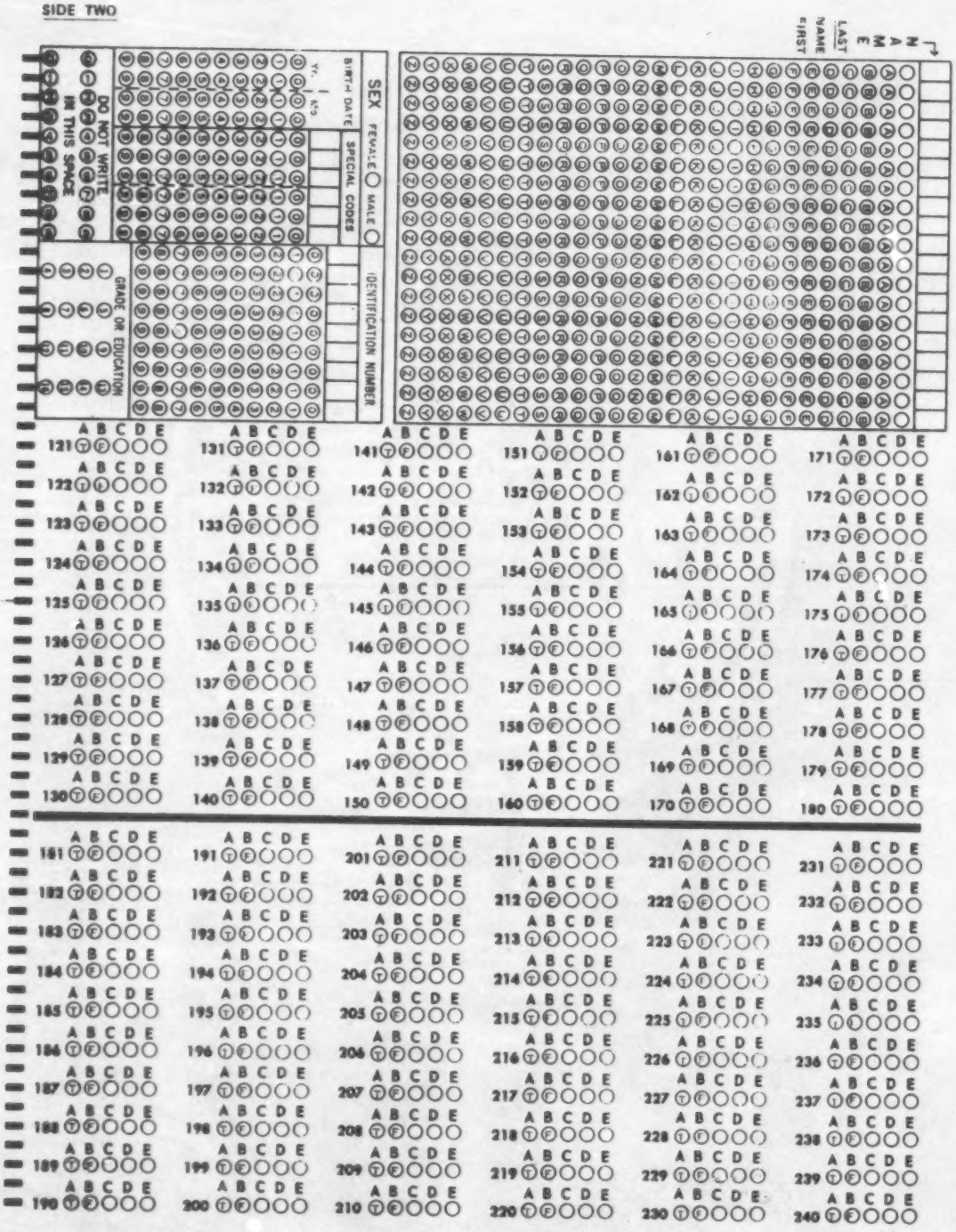
← REFER TO THESE EXAMPLES BEFORE STARTING PRACTICE EXERCISES →

PRACTICE

1 A B C D E
2 A B C D E
3 A B C D E
4 A B C D E

1 A B C D E	11 A B C D E	21 A B C D E	31 A B C D E	41 A B C D E	51 A B C D E
2 A B C D E	12 A B C D E	22 A B C D E	32 A B C D E	42 A B C D E	52 A B C D E
3 A B C D E	13 A B C D E	23 A B C D E	33 A B C D E	43 A B C D E	53 A B C D E
4 A B C D E	14 A B C D E	24 A B C D E	34 A B C D E	44 A B C D E	54 A B C D E
5 A B C D E	15 A B C D E	25 A B C D E	35 A B C D E	45 A B C D E	55 A B C D E
6 A B C D E	16 A B C D E	26 A B C D E	36 A B C D E	46 A B C D E	56 A B C D E
7 A B C D E	17 A B C D E	27 A B C D E	37 A B C D E	47 A B C D E	57 A B C D E
8 A B C D E	18 A B C D E	28 A B C D E	38 A B C D E	48 A B C D E	58 A B C D E
9 A B C D E	19 A B C D E	29 A B C D E	39 A B C D E	49 A B C D E	59 A B C D E
10 A B C D E	20 A B C D E	30 A B C D E	40 A B C D E	50 A B C D E	60 A B C D E
61 A B C D E	71 A B C D E	81 A B C D E	91 A B C D E	101 A B C D E	111 A B C D E
62 A B C D E	72 A B C D E	82 A B C D E	92 A B C D E	102 A B C D E	112 A B C D E
63 A B C D E	73 A B C D E	83 A B C D E	93 A B C D E	103 A B C D E	113 A B C D E
64 A B C D E	74 A B C D E	84 A B C D E	94 A B C D E	104 A B C D E	114 A B C D E
65 A B C D E	75 A B C D E	85 A B C D E	95 A B C D E	105 A B C D E	115 A B C D E
66 A B C D E	76 A B C D E	86 A B C D E	96 A B C D E	106 A B C D E	116 A B C D E
67 A B C D E	77 A B C D E	87 A B C D E	97 A B C D E	107 A B C D E	117 A B C D E
68 A B C D E	78 A B C D E	88 A B C D E	98 A B C D E	108 A B C D E	118 A B C D E
69 A B C D E	79 A B C D E	89 A B C D E	99 A B C D E	109 A B C D E	119 A B C D E
70 A B C D E	80 A B C D E	90 A B C D E	100 A B C D E	110 A B C D E	120 A B C D E

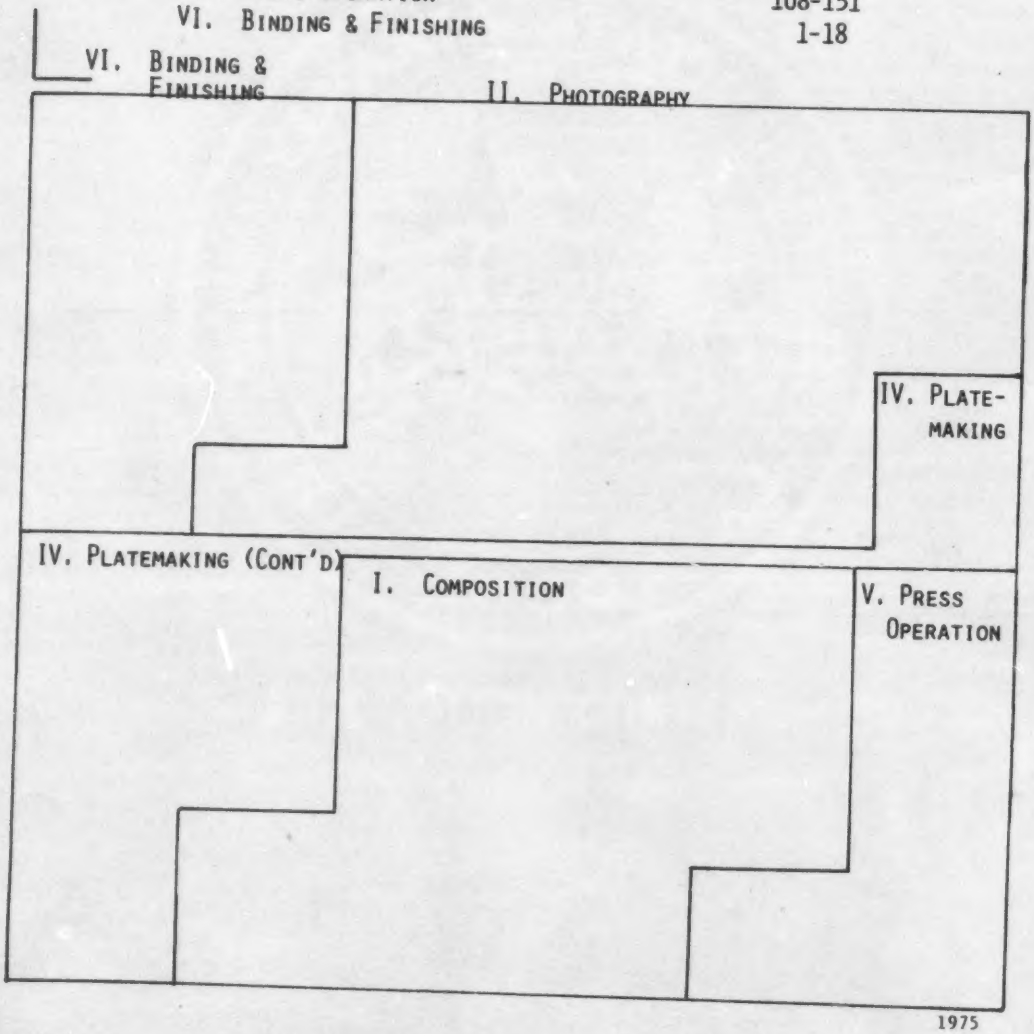
Example 7 (continued)



Example 8

GRAPHICS ARTS (OFFSET)
U. S. O. E. NUMBER 17.1900
PENNSYLVANIA CERTIFICATE NUMBER 2057
DIAGNOSTIC DATA FOR O. C. E. P. COORDINATOR USE

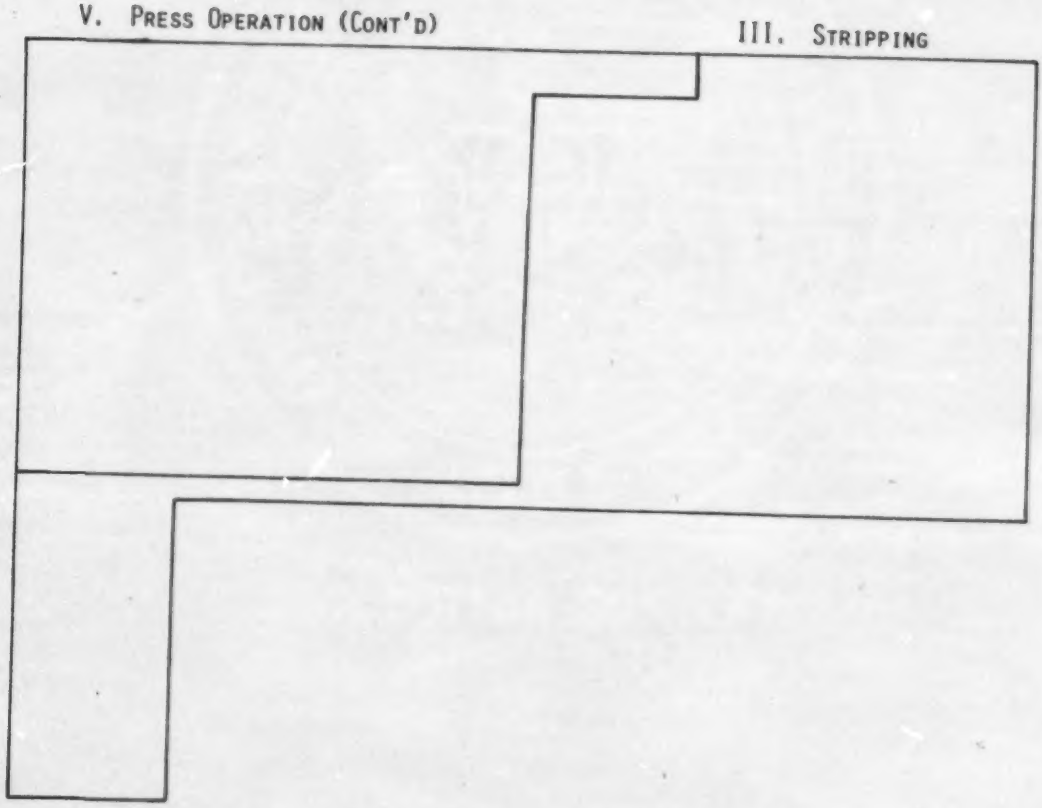
		QUESTIONS
I.	COMPOSITION	77-107
II.	PHOTOGRAPHY	19-56
III.	STRIPPING	152-187
IV.	PLATEMAKING	57-76
V.	PRESS OPERATION	108-151
VI.	BINDING & FINISHING	1-18



Example 8 (continued)

GRAPHICS ARTS (OFFSET)

PAGE 2



1975

APPENDIX F

Example 1 Performance and Written Examination Proportioning Work Sheet
Example 2 Cover Sheet--Performance Test Examiners Copy
Example 3 Performance Examination--Examiners Report
Example 4 Performance Examination--Job Description Sheet
Example 5 Performance Examination--Examiners Instructions
Example 6 Performance Examination--Materials, Tools, Equipment List
Example 7 Performance Examination--Directions for Examiner Sheet
Example 8 Performance Examination--Examiners Drawing
Example 9 Performance Examination--Evaluation Sheet
Example 10 Cover Sheet--Performance Test, Candidates Copy
Example 11 Performance Test Instructions to Candidate
Example 12 Performance Examination--Safety Evaluation Sheet
Example 13 Performance Examination--General Instructions to Candidate
Example 14 Performance Examination--Directions for Candidates Job

PROPORTIONING WORK SHEET

TITLE	%	WRITTEN QUESTIONS
I	10	20
II	20	40
III	25	50
IV	40	80
V	15	30
	100	200

TITLE	%	PERFORMANCE TIME-MINUTES	SCORE
I			
II	40	96	96
III	20	48	48
IV	25	60	60
V	15	30	30
	100	4.00	240

TITLE	JOBS	TIME	SCORE
I			
II	1	30	30
	2	66	66
III	3	48	48
IV	4	30	30
	5	30	30
V	6	36	36
		240	240

Example 1

Example 2

PERFORMANCE TEST

EXAMINER'S COPY

Example 3

EXAMINER'S REPORT - PERFORMANCE EXAMINATION

Name of Candidate_____ Occupation_____

Subjective Evaluation of Candidate: (check appropriate column)

	excellent	satisfactory	unsatisfactory
1. Manipulative			
2. Speed			
3. Technique			
4. Emotional reactions			
5. General attitude toward work			
6. Safety (an unsatisfactory in this area fails the candidate).			

Objective Report:

1. Total points on examination_____; Raw score (no. correct)_____;

2. Percentage_____% (divide raw score by total points)

From your observation of the candidate, what do you believe are his/her areas of weakness?

_____

_____

_____

_____

_____

Do you recommend the candidate? Yes____ No____

If no, do you recommend a re-examination? Yes____ No____

Location:_____

Date:_____ Examiner's Signature_____

Candidate's Statement of Withdrawal

I hereby indicate my voluntary withdrawal from the above examination.

_____ _____ _____

Candidate's Signature Date Hour

Example 4

JOB DESCRIPTION

WELDER COMBINATION

Welds metal parts together, according to layouts, blueprints or work orders, using both oxyfuel welding (OFW) or brazing and any combination of arc welding processes:

(Welder Arc: Shielded Metal Arc Welding (SMAW)
Oxyfuel Welding (OFW)
Gas Metal Arc Welding (GMAW)
Gas Tungsten Arc Welding (GTAW).

Performs related tasks such as flame cutting and grinding. May repair broken or cracked parts, fill holes, and increase size of metal parts. May position and clamp together components of fabricated metal products preparatory to welding.

Welder Repair (welding) maintenance welder. Repairs worn or damaged machined, fabricated, cast, forged or welded metal parts as specified by sketches, diagrams, or sample parts, using arc or gas welding equipment or processes. Examines workpiece and measures dimensions for conformance to specifications, using tape, rule or square. Tests workpiece for defects, chips or grinds out holes, bubbles, or cracks in workpiece preparatory to filling with weld. Cleans grease or corrosion from workpiece, using wire brush or grinder. Clamps broken parts together in jig or vise and welds them using OFW or arc welding process, according to type and thickness of metal. May cut defective part from assembly, using bandsaw or cutting torch, and reweld new piece into place. May straighten bent pieces, using hand torch, straightening press, or jack and stanchion. May weld layers of metal onto damaged parts to obtain original dimension. May specialize in filling holes, bubbles, and cracks in defective castings and be designated as Welder Combination.

Example 5

WELDING

EXAMINER'S INSTRUCTIONS

GENERAL

The purpose of the examination is to ascertain with a reasonable degree of confidence, the candidate's ability to perform the manipulative functions of his trade.

Prior to the time the candidate reports, sufficient time should be devoted to the preparation of equipment and materials. Avoid confusion! Review the examination before the candidate arrives.

Arrange project material and check all equipment so that the candidate moves through each work station in the prescribed sequence.

Objective scoring of the examination assures each candidate that identifical evaluative criteria will be used by each examiner. For example, a Welding Standard information sheet is included for clarification of the specifications.

Each candidate should attempt to complete all projects within the prescribed time limit. The examiner must stress the critical nature of the time element for each candidate even though the time factor is not used for project evaluation. However, at the designated time limit of five (5) hours, the candidate looses all points for any remaining welding projects that were not attempted, or completed.

SCORING

1. The candidate will be given a two (2) on the evaluation sheet if the weld check point or points have no discontinuities as specified on the weld standard information sheet.

2. The candidate will be given a one (1) on the evaluation sheet when a condition exists, but is within the limits of the standards as described on the weld standard information sheet.

3. The candidate will be given a zero (0) as a score when the condition is outside of the limits as described in the weld standard information sheet.

As the candidate completes each project, he will remove the project sheet from the test booklet and place it along with the project in a location specified by the examiner. Therefore, it is necessary that each candidate be provided with a space of adequate size to accommodate his projects and his test material.

Example 5 (continued)

WELDING

EXAMINER'S INSTRUCTIONS

The examiner may evaluate the projects as they are delivered to the grading area. The individual project scores can then be transferred to the master score sheet for final evaluation prior to being mailed to the University.

SAFETY

A SAFETY EVALUATION SHEET is included in the candidate's test booklet. It will be removed by the candidate and given to you before the examination begins. Please read the directions on the sheet and check to see that the candidate has placed his name in the place provided.

Example 6

I. Material

1. Unbleached muslin and light weight cotton
2. Pattern (jak-shirt Girl's size #6) Simplicity #6533.
3. Pattern (skirt Girl's size #6) Simplicity #7606.
4. Buttons (various sizes)
5. Thread single "0" (various colors)
6. Thread double "0" (various colors)
7. Needles (various sizes) (size 14 for light weight cotton)

II. Equipment

Single needle machine

Plus at least two of the following:

Zig-zag machine
Merrow (overedging) machine
Button machine
Buttonhole machine
Bartack

III. Tools

Scissors (various sizes)
Screwdrivers (various sizes)
Threading wire
Wrenches (various sizes)
Tweezers
Pin Wrench

Examiner: Please be sure to have all of the above material, equipment and tools on hand five days prior to the test.

Example 7

OCCUPATIONAL COMPETENCY EXAMINATION

DIRECTIONS FOR EXAMINER

JOB NUMBER:

CANDIDATE'S NAME: _____

TITLE:

CANDIDATE'S NUMBER: _____

NORMAL COMPLETION TIME:

MATERIAL:

TOOLS:

EQUIPMENT:

SAFETY/ACCIDENT PREVENTION:

DIRECTIONS

SCORING:

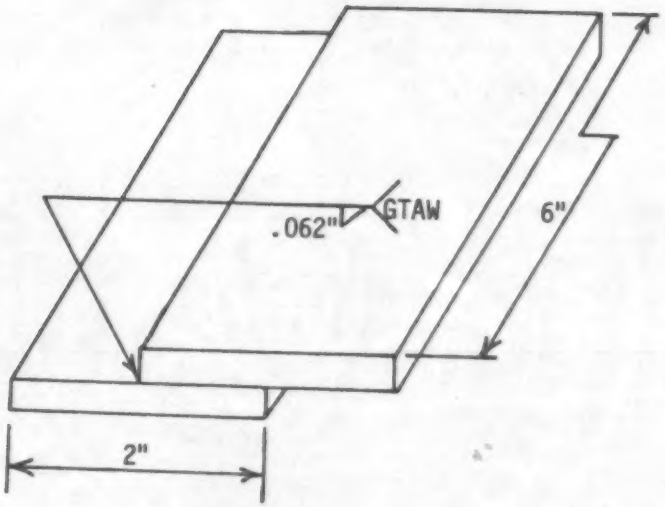
PROCESS:

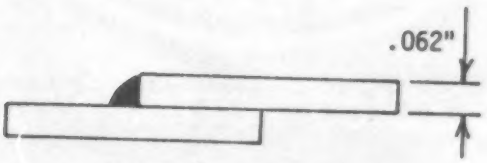
PRODUCT:

Example 8

LAP WELD

POSITION: IF





Front View

EXAMINER'S DRAWING - D-10

Example 9

POWER SEWING
Performance Evaluation

Candidate Name _____
Candidate Number _____

	Scale	Score
SEQUENCE OF OPERATIONS (100 points)		
Choice of parts	0-20	
Placing and sewing	0-40	
Sequence of operations	0-20	
Use of special machines	0-10	
Trimming	0-5	
Pressing	0-5	
SEWING MACHINE (70 points)		
Operation of		
Operation of		
Set up of		
Set up of		
(2% each for operation of any additional special machines)		
Adjustment of the single needle machine		
Sub-Total		

EXAMPLE

	Scale	Score
MATERIALS (20 points)		
Choice of		
Choice of		
Choice of		
Choice of		
Hand sewing		
Choice of		
USE OF TOOLS AND ATTACHMENTS (10 points)		
Gauges		
Presser feet		
Choice of		
Choice of		
Sub-Total		
Total Score		

Example 10

PERFORMANCE TEST

CANDIDATE'S COPY

Example 11

OCCUPATIONAL COMPETENCY EXAMINATION

PERFORMANCE TEST
INSTRUCTIONS TO CANDIDATE

Remember this practical test is your opportunity to demonstrate how well you can perform the various procedures, methods, and skills of your trade or occupation. The examiner will observe and check your work on:

1. MANIPULATIVE
2. SPEED
3. TECHNIQUE
4. NEATNESS AND ACCURACY
5. EMOTIONAL REACTIONS
6. GENERAL ATTITUDE TOWARD WORK
7. SAFETY

Taking a Performance Test may be a new and strange experience for you. Therefore, it is suggested that you follow the instructions listed below very carefully.

1. Obtain all the necessary tools, materials, etc., as directed by the examiner.
2. Examine your work space or station carefully to see that the tools, equipment, etc. are in good working order.
3. Address all questions regarding the work station, work assignment, materials, etc., to the examiner.
4. Avoid talking to other candidates during the examination.
5. Select the method or procedure which you deem best for materials available and then plan all steps accordingly.
6. Advise the examiner when you have completed your assignment. Have him check and identify it with your number and give you directions for the next assignment.
7. Request permission from the examiner if it becomes necessary for you to leave the room where the examination is being conducted.

. If you decide to withdraw from this test, sign the following Withdrawal Statement. "I hereby indicate my voluntary withdrawal from this test."

Signature _____ Date_____Time_____

. Your signature below indicates that you understand the instructions for taking this examination.

Signature_____ Date_____

Example 12

OCCUPATIONAL COMPETENCY EXAMINATION

SAFETY EVALUATION SHEET

Candidate Name _____

Candidate Number _____

INSTRUCTIONS:

During the examination the examiner must check the appropriate column, either satisfactory (S) or unsatisfactory (U). This checklist is to be used as an aid for the examiner in determining the individual's safety consciousness directly related to his trade.

At the end of the examination the examiner must make the final evaluation and check either satisfactory (S) or unsatisfactory (U) in the space provided.

AN UNSATISFACTORY ON ANY SAFETY ITEM WILL BE CONSIDERED AS FAILURE OF THE PERFORMANCE EXAMINATION.

	S	U
1. Handles material in a safe and workmanlike manner.	____	____
2. Uses protective clothing and equipment.	____	____
3. Uses hand tools in a safe manner.	____	____
4. Uses adequate ventilation when working in an enclosed area.	____	____
5. Follows manufacturer's directions when handling solvents.	____	____
6. Uses accepted safety precautions when operating power tools.	____	____

Example 13

WELDING PERFORMANCE EXAMINATION

GENERAL INSTRUCTIONS TO CANDIDATES

The purpose of this performance test is to ascertain, with a high degree of accuracy, the ability of a candidate to perform in the various aspects of his trade in anticipation of teaching that trade.

The following are guidelines that will facilitate the smooth uninterrupted flow of this performance test.

1. The time factor is not used to evaluate a welding project, but it is very important for you to work at your optimum speed which will insure the maintenance of quality in each evaluative area of the test--do not waste time. However, at the designated time limit of five (5) hours, the candidate looses all points for any remaining welding projects that were not attempted, or completed.

2. There are ten (10) projects to be completed within a total alloted time of five (5) hours.

   SHIELDED METAL ARC WELDING, (SMAW)----------3 PROJECTS
   OXYFUEL WELDING (OFW)----------3 PROJECTS
   GAS-METAL-ARC WELDING (SMAW)----------2 PROJECTS
   GAS TUNGSTEN ARC WELDING (GTAW)----------2 PROJECTS

3. The examiner will have all the major equipment and materials prepared and ready at the examination site. Use scrap metal to adjust your machine. Do not strike an arc or run a bead on anything except scrap material.

4. Every candidate must provide his own personal equipment such as: hood, goggles, protective clothing, gloves and any other personal tools or equipment that he deems essential in the performance of this examination.

5. Read each project instruction sheet carefully, be sure that you know exactly what is required to complete the project. Be exact in the selection of the material.

6. Every project will be evaluated in accordance with the criteria listed on the project sheet.

7. In the place provided--sign your name and candidate number on each and every project sheet before you begin the test.

Example 13 (continued)

8. As you complete each project, remove the project sheet from your test booklet and place the sheet and the completed project in the location specified by the examiner.

9. The next page in your booklet is your Safety Evaluation sheet. Sign your name and place your candidate number in the space provided, remove this sheet from the booklet and give it to the examiner before you start the test.

10. You are now ready to proceed to the first project.

ARE THERE ANY QUESTIONS PERTAINING TO THIS TEST?

Example 14

OCCUPATIONAL COMPETENCY EXAMINATION
PERFORMANCE TEST
DIRECTIONS FOR JOB

Candidate's Name _____

Candidate's Number _____

Job Number _____

Title:

1. Special Directions:

   a. Sign your first and last name above and fill in candidate number as assigned to you.

   b. Secure required tools, equipment and materials from the examiner.

   c. Note the normal completion time.

2. Assignment: (Normal completion time -)

   Complete the job as described below and on the following drawing.

3. Time Started _____

   Time Finished _____

4. Score for Job Number:

APPENDIX G

Example 1 Travel Expense Voucher
Example 2 Master List for Test Development or Test Examiner Workshops
Example 3 Cover Letter for Test Development or Test Examiner Notification
Example 4 Verification Response for Test Development or Test Examiner Workshops

THE PENNSYLVANIA STATE UNIVERSITY
TRAVEL EXPENSE ACCOUNT

Purpose of Trip

Voucher Number

Itinerary			Per Diem Days	Private Auto Miles	Air or* Rail	Taxi or Bus	Lodging*	Meals	B, L or D	Other*		Total
Date	Location	Time								Item	Amount	

Example 2

TEMPLE UNIVERSITY

List of Participants
O. C. E. Examiner's Workshop
June 5, 1976

University Park, Pennsylvania
and
Centre County Area Vocational-Technical School

In Consortium With
Temple University, Lehigh University and
The University of Pittsburgh

ALLEBACH, Melvin M.
Appliance Repair
North Montco AVTS
Eagleville Road - R.D. #1
Norristown, PA 19401

BEALS, Elaine R.
Computer Technology
Lehigh Co. AVTS
P.O. Box 963, 39 S. 4th St.
Allentown, PA 18102

BEALS, William B.
Computer Technology
E. Northampton Co. AVTS
P.O. Box 963, 39 S. 4th St.
Allentown, PA 18103

CARDELL, Richard
Auto Repair
North Montco AVTS
487 Groffs Mill Rd.
Harleysville, PA 19438

CARTER, Clarence L.
Metal Fabrication
Board of Education
5248 Diamond St.
Philadelphia, PA 19131

CZOP, John J.
Tool & Die Making
Central Montgomery Co. AVTS
210 Flourtown Rd.
Plymouth Meeting, PA 19462

ENGLE, Larry D.
Brick Masonry
Lehigh Co. AVTS
150-A Forge St.
Bowmanstown, PA 18030

ETTER, George J.
Diesel Mechanics
Central Montco AVTS
222 Walnut St.
Spring City, PA 19475

FITTIPOLDI, Anthony
Upholstery
School District of Philadelphia
1117 Livingston St.
Turnersville, NJ 08012

GAMBLE, Wayne W.
Electrical Occupations
Lehigh Co. AVTS
1955 S. Idaho Street
Allentown, PA 18103

GILBERT, George T.
Radio/TV Repair
Lehigh Co. AVTS
2010 Latta Street
Allentown, PA 18104

GRAVES, Jr., Paul A.
Mechanical Drafting/Design Technology
Lehigh Co. AVTS
18 E. Spruce St.
Emmaus, PA 18049

Example 2 (continued)

HARTEG, Blaine M.
Brick Masonry
North Montco. AVTS
570 Linfield Rd.
Linfield, PA 19468

HORLACHER, Kermit C.
Civil Technology
Lehigh Co. AVTS
537 N. 6th St.
Emmaus, PA 18049

LENDACKI, Cyril J.
Painting and Decorating
Berks Co. AVTS
R.D. #1
Fleetwood, PA 19522

LILLY, John R.
Tool and Die Making
Reading-Muhlenberg AVTS
Route #1, Box 474
Reading, PA 19607

MILANO, Salvatore F.
Textile Production/Fabrication
Philadelphia School District
242 Hoffman Rd.
Ridley Park, PA 19078

NEWTON, Paul W.
Welding
North Montco. AVTS
2030 Rittenhouse Rd.
Harleysville, PA 19438

O'BRIEN, Eldoris J.
Printing
Bethlehem Area VTS
2483 Lincoln Avenue
Easton, PA 18042

REITH, Stanley A.
Building Trades Maintenance
Lehigh Co. AVTS
Box 342 Jasper Rd.
Emmaus, PA 18049

SMOLENYAK, Andrew
Auto Body
Eastern Northampton AVTS
R.D. #1
Pen Argyl, PA 18072

SPADAFORA, Samuel S.
Plumbing
Reading-Muhlenberg AVTS
910 Lancaster Ave.
Reading, PA 19607

CURRY, James H.
Textile Production/Fabrication
118 N. Nice Street
Frackville, PA 17931
Schuylkill County AVTS

MATTEO, Carmen G.
Electrical Occupations
608 Landmesser Avenue
West Hazleton, PA 18201
Hazleton Area AVTS

Example 3

PROPOSED LETTER TO EXAMINERS

THE PENNSYLVANIA STATE UNIVERSITY
247 CHAMBERS BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

College of Education
Department of Vocational Education

Date

Dear

A workshop is planned for persons performing as examiners in the Pennsylvania Occupational Competency Evaluation (OCE) Program. The purpose of the workshop is to develop skill and standardization in examining practices, evaluating techniques, and reporting procedures.

The workshop is planned for Saturday, June 5, 1976, at The Pennsylvania State University, University Park, PA 16802. While the workshop is being hosted at Penn State, it is a joint effort, involving OCE Program coordinators from Lehigh University, the University of Pittsburgh, Temple University, The Pennsylvania State University and personnel from the Bureau of Vocational Education.

This workshop will be a continuation of the examiners' workshop held at Penn State in July 1975, with two (or more) examiners in each occupation from each of the four OCE regions attending. We expect to concentrate on the performance test; reviewing each of the jobs, description of performance evaluation criteria, etc.

We encourage those living further than commuting distance to come in on Friday evening. Rooms will be available at campus residence halls, with accommodations available for family members. (We don't expect the heat spell of last July!) Meals may be taken at campus facilities, although this is not finalized. Sufficient off-campus meal facilities are available, if necessary. Cost for workshop participants will be covered by our funding, but costs for accompanying family members will be the responsibility of the participant. Room charges are $4.40 per per person per night (double) with a limited number of single rooms at $5.50 per person. Meals will average $5 per day if campus facilities are available, or will be somewhat higher if off-campus facilities are used. Persons desiring commercial accommodations will be reimbursed for the cost of campus resident facilities.

Example 3 (continued)

Page 2

Our funding is limited for this workshop, but we will be able to reimburse travel at 12¢ per mile provided car pooling is utilized. We encourage car pooling wherever possible to permit us to stay within the budget. Any tolls, such as Turnpike fees, must be proven by a receipt, to be submitted at the workshop. An honorarium of $20 is also authorized for attendance.

We would like you to complete the attached survey form and return it to us at your earliest opportunity, with April 26, 1976, as the deadline for us to receive it. We will provide information in greater detail, i.e., maps, brochure, agenda, etc., for all persons planning to attend.

Very truly yours,

Gerald W. Funk
Research Assistant

GWF/kbs

Please complete and mail this form to:

Gerald W. Funk
Department of Vocational Education
The Pennsylvania State University
247 Chambers Building
University Park, PA 16802

PLEASE PRINT

Name _____ Home Address _____ Number and Street

City _____ County _____ State _____ Zip _____ Social Security Number

Home Telephone _____ Business Telephone _____ Position

Institution _____ Address _____ Number and Street

City _____ State _____ Zip _____

CIRCLE APPLICABLE WORD(S)

I (do do not) plan to attend the OCE Examiner Workshop at The Pennsylvania State University, University Park, PA on June 5, 1976.

I will require accommodations for _____ additional persons.

Example 4

THE PENNSYLVANIA STATE UNIVERSITY
247 CHAMBERS BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Reference is made to our correspondence of April 9, 1976, regarding participation at a workshop for Occupational Competency Examination examiners scheduled for June 5, 1976. We have not received a reply from you to indicate your attendance or non-attendance.

In the event you did not receive our original correspondence, we have included a copy, with a survey form that is being used for advance registration. Would you please return the survey, marked to indicate your intentions. It is important that we receive your response, so that in the event you are not planning to attend, others who are qualified, and have expressed interest, can be accommodated.

Yours truly,

Gerald W. Funk

Gerald W. Funk
Research Assistant

GWF/kbs

Encl.

APPENDIX H

Example 1 Master List of Occupational Competency Examinations
Example 2 Occupational Competency Evaluation Program Examination Maintenance Form
Example 3 Record of Materials Sent to Other Testing Centers
Example 4 Checklist for Development of Occupational Competency Examinations
Example 5 Frequency of Occupational Competency Examinations Administered Checklist
Example 6 Checklist for Cost Analysis of Candidates Assessed

L - Lenigh A - Available
P - Pitt O - Not Available
PS - PSU
T - Temple Z - Licensure

Certificate Title	U.S.O.E. Code	Certification Title	Status	WRITTEN: Dev. or Revised by and Date	WRITTEN: (N) NOCTI (P) Penna.	WRITTEN: Categorized	WRITTEN: Proportioned	WRITTEN: Descriptions	WRITTEN: Diagnostic	WRITTEN: Passing Score	WRITTEN: Norms	PERFORMANCE: Date Developed or Revised	PERFORMANCE: Criterion Reference Eval.	PERFORMANCE: Passing Score	PERFORMANCE: Norms	PERFORMANCE: Credential Review	Remarks
Aeronautical Technology	16.0101	2501	O														
Architectural-Design Technology	16.0103	2105	A		N	✓	✓	✓	✓		✓		✓				N as of 1/30/75
Audio-Visual Communications Technology	16.0691	2510	A	P / 77	P	✓	✓	✓	✓		✓		✓				
Automotive Technology	16.0104	2008	O														
Chemical Technology	16.0105	2101	O														
Civil Technology	16.0106	2103	A		N	✓	✓	✓	✓		✓		✓				N as of 1/30/75
Drafting Design Technology	16.0121		A		N	✓	✓	✓	✓		✓		✓				Use N Mechanical Drafting
Electrical Technology	16.0107	2107	O														
Electronic Technology	16.0108	2111	O														Use P Electronics
Electro-Mechanical Technology	16.0109	2109	O														
Engineering Technology	16.0100	2104	O														
Environmental Control Technology	16.0110	2113	A	P / 74	P						✓		✓				
Industrial Technology	16.0111	2112	O														
Instrumentation Technology	16.0112	2115	O														
Mechanical Drafting/Design Technology	16.0128	2106	A		N	✓	✓	✓	✓		✓		✓				N as of 1/31/77
Mechanical Technology	16.0113	2117	A		N	✓	✓	✓	✓		✓		✓				N as of 1/31/77

Example 1

Example 2

OCCUPATIONAL COMPETENCY EVALUATION PROGRAM

EXAMINATION MAINTENANCE

TITLE: _____

DATE DEVELOPED: _____

DATE VALIDATED: _____

DATE(S) ADMINISTERED: _____

_____

_____

_____

_____

DATE REVISED: _____

RECORD OF MATERIALS SENT TO OTHER CENTERS

TITLES	WRITTEN	PERFORMANCE		MASTER KEY	DIAGNOSTIC DATA	CAND. EXP. CHECK LIST	PRE-ASSM. EXAM	MASTER KEY
		Examiner	Candidate					

PENNSYLVANIA OCCUPATIONAL COMPETENCY EXAMINATIONS

TITLES

	Written Test	Answer Key	Performance Test	Performance Test Rating Scale	Directions to Examiners	Scoring Criteria	Equipment and Supplies	General Information	Reliability	Validity	Item Analysis	Demographic Data	Historic Data Norms	Occupational Analysis	Related Studies	Topical Description

Example 4

Example 5

O. C. E. P. ADMINISTRATION FREQUENCY

FROM July 1, 1976 TO June 30, 1977

TOTALS FOR PENNSYLVANIA

TITLES	Total Candidates Assessed	Failures	NOCTI	Evaluations X - Licensure Z - Credential Review
Air Conditioning/Refrigeration	3		✓	
Aircraft Maintenance	2			X
Airframe, Aircraft Maint, Aircraft Engine Mechanic	1			Z
Appliance Repair	8	1		
Architectural Design Technology	1		✓	
Architectural Drafting	5	2	✓	
Audio-Visual Communications Technology	1			
Auto Body Repair	8	1		
Auto Mechanic	41	10	✓	
Auto Specialist	1			Z
Baker	3			
Barbering	2			X
Brick Masonry	9	2		
Building Construction Occupation	4			
Building Trades Maintenance	13	4		
Carpentry	28	11	✓	
Commercial Art	5			
Commercial Photography	1			
Computer Technology	15	8		
Consumer Services	3			
Cook/Chef	3			

EXAM CYCLE _____ MASTER COST ANALYSIS _____ TEST CENTER

Candidate Name	Exam Title	Candidate Fee Paid	NOCTI Cost	NOCTI Refund	Number Examiners	Total Examiner Cost	Material Cost	Coordinator Time (Hrs.)	Coordinator Cost	Secretary Time (Hrs.)	Secretary Cost	Computer Time (Hrs.)	Computer Cost	Printing Reproduction Cost	Postage	Telephone	Miscellaneous Expense	Site Coordinator	Custodian	

Example 6